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FELIX MARTI-IBAÑEZ, M.D., Editor-in-Chief
Professor and Director of the Department of the History of Medicine,
New York Medical College, Flower and Fifth Avenue Hospitals, New York, N. Y.

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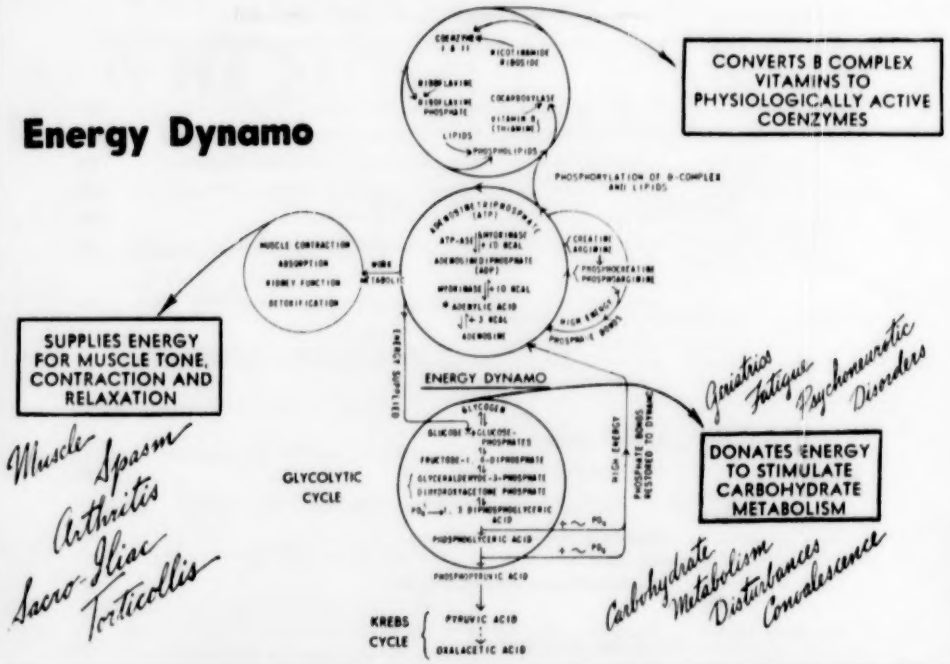

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SYMPOSIUM ON PSYCHOSOMATIC MEDICINE

Psychosomatic Medicine and the General Practitioner

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The recognition of the truly psychosomatic nature of all disease, and the proper management of the patient, rest primarily with the general practitioner. It is my firm belief that psychosomatic medicine is medicine. In other words, it is impossible to practice good medicine without practicing psychosomatic medicine. Any consideration of the surgical aspects of medicine is merely that and nothing more. It is partial and incomplete. A study of the general medical aspects of medicine is equally incomplete. A presentation of the "emotional" features of medicine results in still another unfinished picture. In its basic meaning psychosomatic medicine includes all of these. It is a more complete presentation.

The physician who treats "disease" without the realization that the "disease" is merely the reaction of the human "body" and "mind" to the presence of the disturbing factor or factors in the internal or external environment of that "body" and "mind" is slowly becoming outdated. The modern physician realizes that the terms "body" and "mind" are artificial separations from the facts of life. The fact is that the mind cannot exist without the body. The fact is that the body and mind are one in their reactions. To attempt to divorce "mind" and "body" results only in a linguistic deception. Separate labels such as these may be employed for convenience of discussion. We must continually realize, however, that they are

The papers in this Symposium were presented at the Third Annual Meeting of the Academy of Psychosomatic Medicine, New York City, Oct. 3-6, 1956.

* President Emeritus, Academy of Psychosomatic Medicine.

labels and nothing more. They cannot be employed unless we understand them. They do not represent the facts. The fact is that the body and mind are inseparable in the life functions. They are thus inseparable in the reaction of the body-mind to external and internal environmental irritants such as bacteria, pollen, etc. This reaction is known as "disease."

In psychosomatic medicine as applied to the intestinal tract, we deal with reactions of the body-mind that manifest themselves chiefly in and about the stomach, colon, rectum, and anus. However, you will readily understand that anything I have to say with regard to psychosomatic medicine of the intestinal tract (my own specialty being proctology) may be applied in a less specific sense but with equal profit to a consideration of all other fields of medicine. Just as the mind and body cannot be dissociated, so gastroenterology and proctology cannot be separated from any other field of medicine. The proctologist must see his patient in the entirety. So must the general practitioner, the internist, the urologist, the dermatologist, the general surgeon, the cardiologist.

The patient with a cancer phobia relating to the rectum behaves no differently than the patient with a cancer phobia relating to the lungs. Evidences of anxiety will be found in both cases. The patient with an anxiety neurosis involving pruritus ani or colon hyperactivity as one of the somatic manifestations is essentially the same patient as the one who presents to a cardiologist with palpitation and dyspnea on a psychosomatic basis. Each requires the same understanding, the same explanation, the same opportunity for integration.

The patient with a "semantic twist" who reacts to the word "colitis" as if it means "cancer" is no different from the patient who reacts to the words "coronary disease" as if they mean "sudden death." Both patients require freedom from fear and re-education in the evaluation and meaning of words. The patient who feels that the diagnosis of "tumor" means "cancer" will apply this meaning in his body reactions whether we are dealing with a tumor of the colon or a tumor of the brain. The psychotherapeutic measure provided by a study of general semantics will help to dispel some of the anxiety in these cases. The technique of general semantics is equally well applied by the family physician as part of his therapy.

Unless the physician is trained to think in psychosomatic terms, he will be biased both in his diagnosis and in his therapy. His surgical technique in performing an appendectomy or hemorrhoidectomy may be faultless. His operation of tattoo-neurotomy may be cleverly performed in the treatment of pernicious pruritus ani. However, if he overlooks the anxiety neurosis on which the symptoms and physical findings are ultimately based, his patient will continue to suffer and will look elsewhere for relief. The techniques of psychosomatic medicine are not difficult. They are mastered simply, for they all follow naturally once the physician has accepted a point of view.

I must here introduce a word of caution. Just as it is exceedingly important for the physician to realize the part played by the psyche in the production of "disease," it is equally important that the role not be overstressed. It is an important role, and sometimes a leading role, but it must not be allowed to overshadow the parts of the other players in the drama of "disease." To place the psyche where it belongs

in the scheme of etiologic valuation, it would be wise to pause and review the many possible "causes" of disease.

At the present time medical thinking is directed chiefly toward bacteria and parasites as causes of disease. The bacterial theory of disease has so firm and logical a foundation that we often tend to overlook the other factors involved. It is indeed true that the typhoid bacillus "causes" typhoid fever and the tubercle bacillus "causes" tuberculosis and the *Treponema pallidum* "causes" syphilis and so forth. However, it must be obvious, even on superficial consideration, that this is only part of the truth.

It is unfortunate that we are content too often with only part of the truth. That is not a fault common to medical thinking alone. Indeed, it is the greatest defect of all thinking. We tend to generalize too quickly and on too little evidence, to abstract one factor and disregard all others, not even realizing that we are abstracting. I should like to define the term "abstracting."

Let us assume that an artist looks at a painting of a nude woman. He sees the harmony of color, the technique of brush strokes, the composition, and possibly other technical details. He has "abstracted" these factors from the painting. To the artist those factors are the painting. An interior decorator looks at the painting and she thinks in terms of the appropriateness of that particular subject for a particular location in a particular house. To her the decorative utility of the painting is the painting. She has abstracted that from the painting. The average man looks at the painting and he sees a nude woman. He is not concerned with the quality of brush strokes, or the coloring, or the composition, or whether or not the painting would be suitable for a living room or a bedroom. His reaction is to a nude woman. He has abstracted that from the painting. To him the nude woman is the painting. Each person has reacted differently to the same object, the painting.

We do the same in all our thought processes and in all our reactions to the "realities" of life. However, the moment we realize that we are not seeing everything in its entirety, and cannot possibly do so, we benefit greatly. To realize that we are merely abstracting a few factors from any particular situation is of great consequence. Thus, when we speak of the cause of disease, we must realize that if we speak in terms of bacteria alone, we are abstracting only one factor from the total picture. We are now casting ourselves in the role of the decorator or the artist or the average man. None of these individuals saw the complete picture. No physician sees the complete picture if he thinks only in terms of bacteria.

Now that is of necessity true of all disease. I do not speak of intestinal conditions only, but of all disease. We cannot help abstracting, inasmuch as it is difficult if not impossible for us to see a complete picture. Special training in many fields is required for the observations of all facts. Indeed, it is impossible for one man to achieve sufficient training to see all the facts. Thus, for the physician to understand all there is to be known about the cause of disease, in other words, to abstract every single detail from the picture, he would need to be trained not only as a physician, but as a chemist, a physicist, a biologist, a geneticist, a biophysicist and a biochemist, an anthropologist, a student of semantics, a mathematician, a meteorologist, a psychologist, a psychiatrist, a specialist in every field of medicine, and

in all the other arts and sciences. Indeed, he would ultimately require training in phases of arts and sciences not yet discovered. It thus becomes manifestly impossible for any single individual to know all the answers.

Therefore, it is important that we realize our limitations. We should not use terms that indicate a belief that we are speaking the last word. We should not speak in terms of cause but rather in terms of causes. We should not speak in terms of all cases but in terms of some cases. We should never assume the role of omnipotence or omniscience. We must always speak in terms of our present conception, realizing that it is merely an abstraction and that we cannot possibly know all the facts at this time. We must recognize our theories for what they are. We must recognize that our facts are, for the most part, also theories. They represent abstractions from reality by our sense organs and the instruments with which we use our sense organs. In other words, the eye plus the microscope abstracts certain findings from the blood smear or the polluted water. The eye plus the microscope cannot possibly abstract all the information that lies within the blood or the water. The electron microscope abstracts still more. However, there is undoubtedly even more to be abstracted, but this must await further development of man's technical knowledge and thus further extension of his sense organs.

The physician who abstracts the psychogenic factors in every disease becomes a psychiatrist. The physician who abstracts the bacteriologic factors in every disease becomes primarily a bacteriologist. The physician who sees heredity at fault in every disease becomes a geneticist. Each is abstracting that which seems most important to him in the picture. Each has part of the truth. To be well-rounded physicians we must accept the truth wherever we find it, recognizing that the truth is not given in its entirety to any one man and that we cannot ever have the complete truth at any one time. We must realize that the truth at this moment may not be the truth at the next moment. We must be aware of factors outside our own specialty.

Time does not permit a full discussion of the factors I have abstracted from the picture known as "disease." For those of you who are interested in a further pursuit of this approach to psychosomatic medicine I may suggest my own textbook, *A Handbook of Psychosomatic Medicine with Particular Reference to the Intestinal Disorders* (Julian Press, 1951). I would merely stress now that you must avoid the pitfall of single causation in any consideration of "disease." I recommend to you the papers to follow, for each will present—I am certain—a different and interesting facet of the many possible "causes" of disease. They will each illustrate the fact that psychosomatic medicine is medicine.

Recent Advances in Psychobiology and Their Impact on General Practice

Mortimer D. Sackler, M.D., Raymond A. Sackler, M.D., and Arthur M. Sackler, M.D.

THE VAN OPHUIJSEN CENTER; EDITOR OF THE JOURNAL OF CLINICAL AND EXPERIMENTAL PSYCHOPATHOLOGY
NEW YORK, N. Y.

CURRENT SITUATION

For years it has been customary to speak of the contributions made by psychiatry to the practice of general medicine. However, contemporary dramatic advances in physiology and in the pharmacobiologic management of mental disease make it more appropriate to speak, perhaps, of the important contributions to psychiatry that are being made by advances in general medicine.

As Altschule has recently remarked, the information that a physician should have of both normal and pathologic psychology includes "(a) the facts of the neurophysiology of behavior, (b) the data of experimental psychology, and (c) material derived from dynamic and social psychology."

Unfortunately, until recently in our country, dominant psychiatric attention has been directed only toward the problem of social and dynamic psychology. This emphasis has not been universal, and psychiatry in other lands has not strayed so far from its source in organic medicine. Thus it is not accidental that the two major drugs currently used in the treatment of mental disease—reserpine and chlorpromazine—originated in India, Switzerland, and France, and only later came to be used in the United States.

The serious integration of psychiatry with that biologic orientation that is the foundation of a scientific medicine has only now begun to occur on a broad and ever-expanding front in our country. In the past, with a few noteworthy exceptions, therapy in psychiatry meant psychotherapy, almost exclusively, and the cautionary words of Freud have gone unheeded. This great pioneer and innovator, himself a most creative inventor not only of a psychologic system to explain mental symptom formation but also of a new type of therapeutics—namely, analytic psychotherapy—brilliantly anticipated current trends when he stated: "We must bear in mind that some day all our provisional formulations in psychology [*psychologische Vorlaufigkeiten*] will have to be based on an organic foundation. It will then probably be seen that it is special chemical substances and processes which achieve the effects of sexuality and the perpetuation of individual life in the life of the species."

This centennial year of Freud's birth (1956) has been marked by the acceptance of new pharmacologic agents as the therapies of choice in the treatment of psychoses. It is also characterized by the development of a widespread research effort to determine their method of action as well as the etiologic and pathogenetic mechanisms underlying the psychiatric disorders. This is a fitting coincidental memorial. As early as 1950 van Ophuijsen, in his introduction to the *Endocrinologic Orientation to Psychiatric Disorders*, recalled, as he was wont to do, Freud's remark to him in 1927 that "Of

course, you know, I am firmly convinced that one day all these disturbances we are trying to understand will be treated by means of hormones or similar substances."

With the rapid development of a new biologic psychiatry, it is particularly pertinent once again to formulate some ideas on the manner in which such advances can be incorporated into the general practice of medicine. Further, it is necessary to explore some of the considerations and precautions that must attend the responsible integration of modern biologic psychiatry into general medical practice.

The problem of utilizing new psychiatric concepts and therapeutic techniques and agents is perhaps more pressing for the general practitioners and internists than for the psychiatrists, for it must never be forgotten that the former carry an absolute case load of patients with neuropsychiatric disturbances that is many times larger than that which is handled by the psychiatric specialists. Rennie has estimated that the "psychoneuroses constitute the bulk of every general medical practice. By conservative estimate 60% of all patients who go to private physicians suffer not from organic disease but from psychoneurotic conditions." And Strecker and Ebaugh declare that "40% or 50% of those coming to the general practitioner's office have a psychoneurosis as the major cause for the seeking of treatment."

With these facts in mind, it is not at all surprising that the medical profession as a whole has turned enthusiastically toward methods for the biologic and pharmacologic management of the illnesses that beset the majority of patients. These newer therapies, too, strike a responsive chord because their use is consonant with long-standing organicistic thought and therapeutics in general medicine.

It is certainly clear that the modern expansion of psychobiology represents the successful continuation of the great physiodynamic therapies—insulin coma, electroconvulsive therapy, pentylenetetrazol shock, hormonal and other biochemotherapeutic agents. This makes it possible to anticipate that the medical philosophy in which mind and body are viewed as different aspects of a single organic system will become a practiced reality and not a concept to which we give mere lip service.

THE SCIENTIFIC BASIS OF THE BIOPHARMACOLOGIC THERAPIES

We can welcome the ascendance of the biopharmacologic approaches in psychiatry as a major step forward in medical history. However, in addition to their inherent promise, present-day therapeutic modalities contain within themselves a potential threat to the continuing development of scientific psychobiology.

We can, given the inventive powers of the pharmacologist and biochemist, occupy ourselves entirely with conducting clinical trials with new substances. To follow such a path exclusively could be disastrous since it would divert us from the central problem—the problem of the *how* of an effect—its mechanism.

No one of us should be satisfied solely with devising names for the new agents from the classical languages. Nor should we allow expediency at a clinical level to divert us from studies aimed at uncovering physiodynamic mechanisms. Though a term such as "ataraxic" may give an accurate description of the subjective changes noted, its very choice again emphasizes a somewhat superficial concern with resultant psychologic phenomena rather than with the more basic physiologic level of action.

Certainly they provide us with no notion of mechanism of action, nor do such appellations point up a new avenue of exploration. If we accept the concept of tranquilization or ataraxia as a therapeutic end in itself, we may fail to grapple with the more important and challenging problem of mechanism of action and its relation to the etiology and pathogenesis of mental disorder. We must question: Is the drug acting on the nervous system? Does it affect the reticular activating system? How does it influence autonomic activity? What is the effect on the endocrinium? Are the symptoms with which we deal reflections of a pathologic metabolic state? If so, what steps must be taken to define this state? What clues do the new therapeutic agents supply as to the underlying pathogenetic mechanisms of the disorders for which they are helpful?

THE PRESENT HAS HISTORICAL CONTINUITY WITH THE PAST

We gain a somewhat deeper understanding of some of the possible biologic mechanisms underlying mental disease, as well as a broader perspective of contemporary biopharmacologic psychiatry, if we view the recent advances against the background of understanding that has been provided by the older physiodynamic therapies in psychiatry. Through the years, these therapies have made it possible to accumulate a vast body of physiologic data out of which certain tentative formulations about the nature of psychiatric illness can be distilled.

The older physiodynamic therapies highlighted the possibility that either neuroendocrinologic or other metabolic derangements, or both, underlay the symptom complexes found in the major psychiatric disorders. These therapies, regardless of whether in any specific instance it was insulin coma, electroconvulsive therapy, gonadal hormones, histamine, or thyroid, have been noted to afford clinical benefit often associated with metabolic changes or modification of existing pathophysiologic processes. In many patients improvement was limited in duration, and too often the psychiatric symptoms returned after cessation of treatment. These facts suggest that the earlier therapies either induced temporary modification of an abnormal organic state or prepared the way in some patients for more permanent and sometimes, perhaps, spontaneous physiologic readjustment.

We have often referred to the analogy of diabetes mellitus and its necessary continuing therapeutic compensation as an illustration of why we believed the major psychiatric disorders would often require continuous therapy. It is only to be expected that a chronic metabolic disorder may tend to require continual and even changing treatment for the relief or removal of symptoms without in any way necessarily influencing the basic underlying disease process. This is only too evident to anyone who has observed diabetes, the collagen diseases, the asthmatic states, and many others.

What data have been accumulated as to the physiologic alteration or pathophysiologic correction induced by both the old and the new physiodynamic therapies in psychiatry? For the purpose of this report, we shall limit our discussion to some of the elements that are common to several of the therapies or are in some way indicative of basic processes.

1. *Changes in Pituitary-Adrenal Function.*

(a) There is a phase of early pituitary stimulation with increased thyroid-stimulating hormone (TSH) and ACTH production in response to initial electroconvulsive therapy and insulin coma.

(b) Continuing therapy, however, leads to eventual depletion of ACTH, though TSH levels remain elevated. (This was noted in laboratory studies by Reiss et al in England after daily electroconvulsive therapy and after a single insulin coma. The effects of chlorpromazine have not been reported in full by these workers, though Co Tui at Creedmoor has noted a significant fall in blood levels of 17, 21 dihydroxy-20-ketosteroid in psychotic patients after chlorpromazine administration.)

These findings are in accord with the earlier reports by the van Ophuijsen–Sackler group of increased eosinophilia after testosterone therapy with a high degree of correlation between clinical improvement of the psychiatric disorder and the level of adrenocortical depression indicated by the eosinophil reaction. A similar effect has been noted after spontaneous remission and insulin coma. This suggests that a possible common mechanism of action is characterized by antiadrenosympathetic effects.

The importance of this common denominator seems to be emphasized by the varying influence of chlorpromazine and reserpine on blood ketosteroid levels. This is of interest in view of the clinical reports at the last American Psychiatric Association meeting, which as a group favored chlorpromazine over reserpine in the treatment of the psychotic patient. Reserpine was not noted by Co Tui et al to depress blood ketosteroid level, while chlorpromazine did.

In 1950, together with a detailed review of the use of gonadal hormones in psychiatric practice, we reported on the value of testosterone and estradiol in psychiatric disorders even when administered over a control period of only four weeks. Altschule, Reiss, and Sands have made similar observations on the beneficial use of testosterone. Bower and Altschule have reported that progesterone is beneficial for the post-partum psychotic-corroboration of our earlier preliminary findings.

The clinical value of the gonadal hormones in general geriatric practice is now well recognized. I am certain that every day those in general practice who prescribe such agents are observing the influence of endocrine substances on mood, mentation, and content of thought.

2. *Abnormalities of carbohydrate metabolism* are frequently encountered in the psychoses. Such deviations are shifted in the direction of normalcy by insulin, electroconvulsive therapy, testosterone, and histamine. This has been reported by Altschule, Nadeau and Rouleau in Canada, and ourselves, among others. Insulin insensitivity in schizophrenics has been noted by the Canadian workers to be influenced (in the direction of normalcy) by histamine, especially when therapy has been beneficial.

3. *Histamine, Insulin, and Thyroid Tolerance.* We have been impressed by the ability of the schizophrenic to withstand extreme or massive doses of histamine and thyroid. This biologic phenomenon may have diagnostic significance since successful therapy alters this state. This finding has since been corroborated. While the patient's tolerance is influenced by the administration of the older therapies, the effect of the new pharmacologic agents has not yet been explored.

4. *Dissociation in Thyroid Function.* While either hyper- or hypothyroidism (in a clinical sense) can be noted in the presence of psychiatric disturbance, the complete picture remains to be worked out. The English workers, Reiss, Sands, Robinson et al, have reported interesting observations in regard to the utilization of thyroid hormone both as a therapeutic agent and as a clue to the existence of pathophysiologic disturbance associated with psychiatric manifestations.

It is important to emphasize the finding by Cranswick, by Bowman et al, and by Robinson of increased iodine uptake in schizophrenic patients. However, this often seems to be associated with normal or low rather than elevated basal metabolic rate and protein-bound iodine level. The full significance of this physiologic dissociation has not as yet become apparent, but the study is certainly suggestive. Sands, in his recent publication, points out that studies of thyroid function in individual patients may be utilized in prognostication. He notes that thyroid function is also an objective aid in the selection of therapy—e. g., insulin coma, thyroid, or high doses of testosterone.

At this time I wish to refer to a study that may have genetic or congenital implications in this regard. At the Creedmoor Institute we found deviation in thyroid function in 5 of 8 mothers of schizophrenic children even though these mothers themselves had not had an overt psychotic episode.

5. *The methacholine-epinephrine test* of Funkenstein has utilized blood pressure response for prognostic purposes prior to electroconvulsive therapy. Its relationship to the newer therapeutic modalities has not been worked out.

6. *Serotonin and Norepinephrine.* More recent work has implicated serotonin with reserpine and norepinephrine with chlorpromazine. The relationship of these parameters with those previously elucidated also remains as a problem for future study. The frontier, however, has been advanced from the region of neuroendocrine functional relationships to that more subtle one of intracellular enzyme interaction.

7. While it is most important to recognize the major forward strides that we are making with pharmacologic agents, it would be an error to neglect the further study of the biochemotherapeutic substances. Previously, attention was in the main directed to the hormones and like substances as well as to the vitamins of the B complex and more particularly niacin. Only a short time ago Barrabee et al corroborated Himwich's report, and Katz and Kowaliczko confirmed the effectiveness of monosodium glutamate and vitamins in countering many of the psychologic aberrations so often noted in patients past 50. The significance of these studies is at least as great as those with reserpine and chlorpromazine, especially if one recognizes that cerebral decompensation among our expanding geriatric population may soon overtake the functional psychoses as the major medicosocial problem of our time.

Thus it is apparent that the biologic research carried out by relatively few investigators in this country in the recent past and by a larger number of researchers abroad has fortunately provided us with a foundation and points of reference that will undoubtedly be of inestimable value if properly utilized.

ARE WE A DRUG-ADDICTED NATION?

During the past three decades American psychiatry has moved far from its original

psychobiologic inheritance. The metabolic orientation of Weir Mitchell and the historico-biographic approach of Adolf Meyer have tended to be replaced by dependence on a one-sided psychodynamic expansion of Freud's views. (It is important to remember that Freud himself never truly left the psychobiologic tradition.) Therefore, it is not surprising that modern pharmacodynamic therapy does not spring from the American psychiatric activity of the recent past. It is well to remind ourselves that our present advances are imported particularly from French and Swiss biologic psychiatry. However, the warm welcome accorded to these new therapeutic agents in our country by both general medicine and clinical psychiatry is a clear sign that the long latent psychobiologic tradition is once again assuming its rightful place in medical thought and practice.

It is, therefore, distressing to read newspaper reports in which psychiatrists seem to imply that the new pharmacodynamic therapies are making us into a "drug-addicted nation." Even more disturbing is the statement prepared by the Committees on Research, Therapy, and Public Information of the American Psychiatric Association. In this document we find once again what appears to be the remnant of an antibiologic, outmoded viewpoint. Even though this statement begins by welcoming the new drugs, its entire argument remains chained to the earlier philosophic viewpoint that led to a lack of biologic exploration in American psychiatry. The Committees, in this statement, declare:

> The evidence is that these drugs are effective in making disturbed patients in mental hospitals more readily accessible to treatment. [To what "treatment" do the committees refer? Are the drugs themselves considered not to be treatments? Is psychotherapy the unnamed brand of treatment? If it is, why the reluctance to identify it? If other treatment is being utilized along with the new drugs, what data are available on their effects with and without the new agents?] This has made possible impressive advances in mental hospital treatment programs and increased discharge rates. Further, by making patients more comfortable, the drugs have contributed greatly to improving the atmosphere and the management of mental hospitals. It seems clear also that the drugs are useful adjuncts in the psychiatric treatment of certain patients in private practice and on an outpatient basis in clinics and hospitals, though the extent and the conditions under which this practice will prove sound remains to be confirmed through prolonged and careful study. [May I respectfully ask why the drugs are relegated to the role of an adjunct? Perhaps there exists adequate reason for so doing, but where are the data upon which this is based?]
>
> Psychiatrists are at the same time concerned about the apparently widespread use of the drugs by the public for the relief of common anxiety, emotional upsets, nervousness, and the routine tensions of everyday living.
>
> . . . Casual use of the drugs in this manner is medically unsound and constitutes a public danger. [We all agree that casual use of drugs may be harmful, but with some minor exceptions, I do not think that our medical colleagues use drugs casually. With the next statement I am in full agreement, and I am certain you will be too.] The tranquilizing drugs have not been in use long enough to determine the full range, duration, and medical significance of their side effects. Use of these drugs is no more to be encouraged than use of any other drug except where proper medical diagnosis determines that a drug is indicated to maintain the life and functioning of a person. The prescribing of the drugs for emotional illnesses carries with it an obligation for continuing appraisal and supervision by physicians fully aware of the psychiatric symptoms involved and the potentials of their course of development, alteration or remission.

The committees' statement, it seems to me, makes the assumption that psychotherapy is the treatment of choice in psychiatric disorders. It is clear that present-day advances in the medical treatment of anxiety states, neuroses, tensions, and especially psychoses are sharply calling this assumption into question. New concepts and methods whereby psychiatric disorders are managed by the long-term and ever-continual administration of pharmacodynamic agents, e. g., enzymes and antienzymes, metabolites and antimetabolites, and of physiologic (not psychotherapeutic) adjuncts are the future of psychiatric medicine. In this future it is the general practitioner and psychobiologist—not exclusively the psychotherapist—who will assume the crucial therapeutic role.

WE ARE NOT A DRUG-ADDICTED NATION

In the past, the barbiturates have been widely employed (mainly under medical control, though at times self-prescribed) in order to ameliorate the disruptive consequences of the minor psychiatric disorders. The most widely self-used and abused agent is, of course, alcohol. Narcotics, too, are often initially used for similar relief and escape.

The advantages of the present drugs over the previous less adequate measures is highlighted by the fact that for the first time we are noting reductions in state hospital readmission and admission rates.

The search for relief, elimination, and prevention of anxiety, tension, and depression, among other psychologic dysfunctions, is as legitimate as the search of the patient with diabetes or any other chronic disorder for the alleviation of his symptoms. This quest appears to us to be an expression of the patient's own conviction or hope that he is not "weak of mind."

For those who still feel that situational impacts rather than biologic forces are of primary importance, we may again look to experience in general medical practice, as reported by Johnson in a recent issue of the *New England Journal of Medicine*.

This investigator compared 575 consecutive patient visits in 1935 with 1332 visits in 1955, excluding repeat visits for the same illness. Sex ratio was identical, but the age average showed an increase. After exclusion of patients who presented themselves for routine examination and immunization, Johnson found that the incidence of those illnesses not in the organic categories (infection, physical and chemical agents, metabolic disorders, neoplastic disease) but in the categories he termed psychosomatic disorders had remained unchanged—59 per cent in 1935 and 58 per cent in 1955. Certainly our people have been exposed to a variety of situational forces in this 20 year period. Further, this observation is in accord with that of a fairly level incidence of psychosis in different cultural and economic milieux, in different occupations, and in different social levels.

It thus becomes more apparent that regardless of whether the disturbed biology underlying the psychiatric state is the consequence of genetic, congenital, developmental, or any combination of these influences, we must utilize those pharmacodynamic agents currently available—first, to bring relief to our patients and, second, to uncover the physiodynamic mechanisms of their action and the nature of the disease processes

themselves. This will enable us to make more specific our control of mental disease and in the long run to develop appropriate and more scientific methods for a preventive psychiatry. Only then will the "metabolic era" that we hailed as nascent at the International Congress of Psychiatry in Paris in 1950 mature and bring to fruition man's long hoped for salvation from the ravages of mental disease.

SYMPOSIUM ON MEDICINE AND WRITING

The Symposium on Medicine and Writing that appeared in the November 1956 issue of INTERNATIONAL RECORD OF MEDICINE has been published as a Monograph. The articles included in this Monograph are: "The Editing of a Modern Medical Textbook" by Russell L. Cecil; "Plain Talk and Clear Writing" by Morris Fishbein; "The Principles of Bibliographic Citation" by John F. Fulton; "The Art of Communication" by Joseph Garland; "On Writing a History of Medicine" by Douglas Guthrie; and "Minerva and Aesculapius: The Physician as Writer" by Félix Martí-Ibáñez.

This 72 page Monograph is sold for $3.00. As the fourth in the series of MD International Symposia, this book is the companion piece of *Medical Writing*, which was published in May 1956.

To obtain this monograph, write to MD Publications, Inc., 30 East 60th Street, New York 22, N. Y.

An Internist Looks at Psychosomatic Disease

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The topic, "An Internist Looks at Psychosomatic Disease," allows considerable leeway of discussion and permits a consideration of many ramifications of the problem. It gives an opportunity to pose the questions: (1) What are psychosomatic diseases? (2) What is psychosomatic medicine? (3) What makes a patient develop psychosomatic diseases—are there means for their prevention?

I propose to look at this topic in a rather quizzical fashion, to point up some of the general problems and areas of misunderstanding as I see them, and to offer a few suggestions in an attempt to clarify some of the areas of confusion.

WHAT DO WE MEAN BY PSYCHOSOMATIC DISEASES?

To me, one of the most difficult problems, and at the same time one of the sources of great misunderstanding, revolves around the definition of a psychosomatic disease and the clarification of its scopes and of its potentials. The more thought I give to this problem, the more I become confused. Perhaps I am embroiled in an exercise in semantics, but I do not think so. The effects of the psyche on bodily functions are well known and indisputable. The classic experiments of Cannon[1] have clearly demonstrated the effects of rage, of fear, of fright on such functions as blood pressure, blood glucose levels, size of the pupillary openings, intestinal motility, and the like. These are well known and well accepted. Does this mean that psychosomatic diseases are only those in which the emotions affect such bodily functions as mentioned with ensuing disturbance in these and other functions? Surely, in my concept, it does not. On the other hand, we are confronted with a large, rather heterogeneous group of illnesses, classic among them being peptic ulcer, ulcerative colitis, and rheumatoid arthritis. At present the common denominator of all of these is an unknown etiology. There are few thinking physicians who would not readily agree that the emotions do influence the course of these and other entities. Whether the emotions are actually responsible for production of the disease is a different matter. Therein lies an issue of major conflict. I personally profess confusion on this point. That the symptomatology of a patient with a peptic ulcer will be aggravated during periods of emotional stress is certainly well documented. However, many other persons undergo these same stressful situations without developing a peptic ulcer. Either we must probe much deeper into the psyche, and for this we call on the psychoanalyst, or else we must discover what causes the target organ of the stomach or duodenum, placed under the same type of stress, to respond with ulceration in one patient and with no lesion in the next. Here we are confronted with the problem of a person's reaction to a stimulus.

Another concept is concerned with diseases for which, at least as far as the internist is concerned, available evidence does indicate a causal role of the psyche.

For example, a recent survey[2] of 40 patients with cancer of the breast demonstrated a high incidence of sexual inhibition and frustration, poorly developed channels of discharge for instinctual energy and affect, and an important unresolved conflict with the mother. Does this mean that given a person with such analytic findings, cancer of the breast will develop? The internist finds this concept hard to believe and accept. The tendency to find a "psychosomatic element" in the etiology of a variety of organic illnesses is what has caused many an internist to be doubtful from time to time and to question just what we mean by psychosomatic disease.

The dichotomy of psyche and soma is something that must be abandoned in thinking of the sick person. No two people react precisely alike to the same stimulus, be it pleasurable, distasteful, or painful. Similarly, no two people respond in the same fashion to disease. In pneumonia, for example, there may be a difference in response that is related to the degree of pathology, the leukocytic response, or antibody production. Similarly, there are differences in the emotional response to the presence of disease. True, the mind does have an influence on the response to disease, and by the same token, the disease itself affects the individual's psyche. If we believe that all diseases are states or reactions of a person who is a body-mind unit, then it follows that all diseases must be regarded as psychosomatic. All diseases must affect, in some degree, both body and mind.

WHAT IS PSYCHOSOMATIC MEDICINE?

If we have difficulty in defining precisely the nature of psychosomatic disease, can we fare any better with the definition of psychosomatic medicine? One can properly ask whether there is anything new about psychosomatic medicine. Is this merely good medicine with complete knowledge and understanding of the patient as a whole? Is it the touch of the old family physician with his horse and buggy visits? A provocative view is that of the late Dr. Lewis Hamman[3]: ". . . in practice psychosomatic medicine is more a matter of interest and attitude than the acquisition of fresh knowledge and the learning of new and difficult methods of examination and treatment." Many disagree violently with this statement.

In the recent past, discussion concerning the establishment of a psychosomatic medical clinic caused me a great deal of confusion. I found myself trying to decide what type of patient would be referred to such a clinic. Should it be every one with a peptic ulcer, with rheumatoid arthritis, with ulcerative colitis, with low back pain, with a tension headache? Actually, the more one thinks of the role of the psyche in diseases, be they so-called organic or functional or hysterical, then the more one realizes that such a criterion again would apply to all illness, to all sick people. This then means that a "psychosomatic medicine" clinic is merely the general, complete, and ideal medical clinic with a slightly different emphasis.

Let us grant, for sake of discussion, that the psyche is involved to some extent in all illness, be there organic pathology or not. Then it follows that psychosomatic medicine is the study and management of the whole patient—of all influences that make him what he is. Then the thorough internist does not need this label, for presumably he is practicing this type of medicine and using these techniques not

only in the care of his patient, but in the teaching and training of medical students, house staff, and general medical staff. Then Dr. Hamman's statement assumes more force: namely, that we are talking about interest and attitude rather than the acquisition and learning of new methods of examination and treatment.

Let it not be thought for one moment that these statements are condemnations of psychosomatic medicine. Psychosomatic medicine, as a concept, arose from the realization that in many instances the practitioner had been lax in his handling of the sick patient and that he did not appreciate the roles of psyche in disease. This, coupled with the newer knowledge of psychology, of the workings of the mind and its effects on bodily function, naturally channeled much interest and information into this area. The need for research became apparent. Much productive material with tangible evidence has come out of the various attacks on the so-called psychosomatic diseases. To mention two, the works of Wolf and co-workers and Mirsky and co-workers are to be commended.

WHAT ARE THE THINGS THAT PRODUCE PSYCHOSOMATIC DISEASE?

More properly, what are the things that contribute to the prominent role of the psyche in (1) the causation of some disease—if such is the case; (2) the causation of some symptoms; (3) the intensification of symptoms; (4) the continuation of symptoms; and, indeed, (5) the amelioration of symptoms? Are there preventive measures that would aid in minimizing the potential harmful effects of the psyche in the sick patient? If there be preventive measures, what can the internist do in this capacity?

We hear much today about iatrogenic disease—disease induced by the physician. It may be a condition caused by sins of omission or by sins of commission. The patient with digitalis toxicity, the patient with a drug eruption after use of penicillin has, indeed, an iatrogenic disease. But there are many other ways in which the physician induces disease—when he has actually failed in his responsibility in caring for the whole patient. Many times a more sympathetic and tolerant approach to the patient and his illness will avoid much iatrogenic disease. There is always the impulse to do something dramatic, be it the administration of drugs, the use of the surgical knife, or the intravenous infusion of medication.

I like to think of another cause of iatrogenic disease that perhaps is not usually looked upon in this light. This is the physician's readiness to lose patience with his patient, to argue with him, to lose his temper, to show his frustrations. This is clearly pointed out in Osler's essay, *Aequanimitas*, "Deal gently then with this deliciously credulous old human nature in which we work and restrain your indignation when you find your pet parson has triturates of the 1/1000 potentiality in his waistcoat pocket, or you discover accidentally a case of Warner's safe cure in the bedroom of your best patient. It must needs be that offenses of this kind come. Accept them then and do not be vexed."[4]

The physician who shouts at the patient because a medication was not taken at the proper time, or displays anger because the obese individual did not lose the weight that he ordered him to, or is visibly irked because the patient with a peptic

ulcer has not adhered to the extremely rigid diet he was given shows his frustration in not being able to produce a cure. But, perhaps even more than that, it shows the physician's indignation, often not righteous, that the patient dared defy the physician, who allegedly has all-inclusive healing powers. If the physician would realize that he does not cure the vast majority of patients he sees, if he would reckon with these human foibles, if it be the desire to cheat from time to time and not stick to the diet, the desire to take some of Warner's magical safe cure, even though the physician himself has not ordered this medication; if he will reckon with these facts, and approach his patients with serenity, he can accomplish much more. Indeed, he can avoid much iatrogenic disease. For the patient so spurned by his physician goes to the next, who usually spurns him even more. The sequence of rejections will result in new symptoms appearing, be there organic disease or not, or in a "calcification" of those already present.

The physician can lessen some of the harmful effects of psyche on the production and intensification of symptoms by a warm, understanding approach and the use of a large dose of empathy. Objectivity in the management of the sick patient is an excellent thing to have, but one will not be remiss if from time to time he will "put himself in the other fellow's shoes." Before the physician rants and raves at his patient for having missed taking his insulin one morning, before he berates him for having strayed slightly from his diet, it would be well if he examines himself. Might not he too have neglected to take his insulin because he was tired of sticking himself in the arm every single day? Another very apt statement may be borrowed from Osler's *Aequanimitas*, "Curious odd compounds are these fellow creatures at whose mercy you will be, full of fads and eccentricities, of whims and fancies, but the more closely we study their foibles of one sort or another in the inner life which we see, the more surely is the conviction borne in upon us of the likeness of their weakness to our own. The similarity would be intolerable if a happy egotism did not often render us forgetful of it. Hence, the need of an infinite patience and of an ever tender charity towards these fellow creatures. Have they not to exercise the same towards us?"[4]

Honesty on the part of the physician to the patient will, I feel, also aid in this goal of preventing some of the harmful effects of psyche in disease. The patient wants facts. He cannot be fooled as readily as he could in the past. He has been educated by the popular press, including newspapers, scandal sheets, the better known digest type of magazine. There is very little in the way of new principles and methods used in the management of patients that does not appear simultaneously in such publications and, indeed, often before publication in medical journals. We are dealing with an intelligent population, which, by and large, is well informed, often in a disastrous fashion, of the cause of disease and of the use and, more specifically, the misuse of drugs. No longer is the patient content to receive an injection and be informed that he will be well tomorrow—only to find himself still sick one month later. A little more honesty and candor in discussing the potentialities of a disease are well worth the extra time spent for such explanations. The patient can and does appreciate this.

A large and equally important consideration that must be given by the physician

is to all the factors that make this individual not "a case of mitral stenosis," but a patient with a particular ethnic background, with certain financial problems, with a social status in the community, with past emotional experiences, with a family life, and who incidentally has mitral stenosis. All these features play a prominent role in his illness and in his reaction to it. A consideration of these factors and attention to defects where they exist, again though time-consuming, will be most rewarding.

There is the error of the physician in concentrating on minor or insignificant findings while neglecting any aspects of the psyche at all. The patient may have a few or a multitude of vague and usually unrelated complaints with varying degrees of associated disability. The physician feels he must find something wrong and must give medicines. Many times, attention to the whole patient, a complete and thorough work-up, and simple reassurance concerning significance of symptoms and absence of any findings of a "dread disease" will accomplish much. All too often, unfortunately with the zeal to "do something," each symptom is treated with a separate pill; for a basal metabolic rate of −5 per cent, thyroid is given for a "thyroid condition"; for a blood calcium of 9.8 mg./100 cc., calcium is administered for a "calcium deficiency." The closest attempt at treatment of the whole patient will be the inevitable vitamin capsules for the "tired, run-down feeling." The patient thus armed with pills, and most often receiving no relief, turns to another physician and to yet another. Symptoms that could have been rectified have now become "calcified" and are indeed quite difficult to manage. An honest approach describing what has been done and what has been looked for and giving firm reassurance of the absence of findings is quite readily accepted by most patients. However, it cannot be done in a mere five minute visit. One often hears the comment made, "But I do not have such time to spend with patients in my busy private practice." Time spent on the initial visit, obtaining a careful and complete history, performing a thorough physical examination, with laboratory data that are pertinent only to the findings or to potential findings, is quite rewarding. In the long run it results in far superior patient care.

PITFALLS AND TRAPS

What are the pitfalls and the traps of some of the concepts of psychosomatic medicine? What are some of the things that have discouraged the internist from accepting many of these concepts and, in fact, have made him quite antagonistic to them at times? And what are the dangerous trends, at least as I see them? First, there is the tendency on the part of many individuals interested in this field—and again we raise the question, is this really a field of medicine?—to put too much emphasis on cause and effect. All physicians are trained in the scientific approach to a problem. They have learned of experimentation or, more particularly, of the necessity for controls in any experiment, particularly when the results to be recorded are often of a subjective nature. To return to the previously mentioned report of the 40 women with cancer of the breast, one appreciates completely the time, the effort, the money involved in an analysis deep as this appeared to be. But how much more effective and how much more significant this study would have been had it con-

sisted of an analysis of 20 women with carcinoma of the breast and 20 women of comparable age and background without carcinoma of the breast. Thus, if this information were forthcoming in those with carcinoma of the breast and absent in those without it, tremendous significance could be attached thereto.

A case reported by Romano and Coon points up dangers of too much emphasis on cause and effect.[5] The patient concerned had had episodes of peculiar behavior, frustrations because of his tyrannical superior, and had been found perched in the formalin tanks in the anatomy laboratories where he was a diener. Much information concerning his experiences in World War I pointed up significant reasons for his behavior. After many interviews, his psychiatrist noted that after the patient "let off steam" in interviews, his symptoms abated. After further study it was demonstrated that this man had an adenoma of the islets of Langerhans, which hypersecreted insulin and produced the symptomatology described. Fortunately, an alert psychiatrist could not be lulled into a false sense of security over cause and effect relationships. Just because there was ample psychiatric evidence for the patient's behavior it did not rule out organic pathology.

Another patient who came to my attention recently was a man with abdominal pain of a vague and undefinable character. He was studied thoroughly by internists and surgeons, and since nothing could be found, they agreed that his pain had to be psychosomatic, for indeed, there were many unstable features in his background. The psychiatrist who undertook the case uncovered much significant material that was thought to be responsible for the symptomatology. The patient had an infantile wife, he was frustrated in his relations with her, and in general, he was an unhappy, maladjusted individual. The time sequence was perfect for the production of symptoms. The psychiatrist, however, alert to somatic as well as to psychic disease, was impressed by continuation of symptoms and by progressive weight loss. Ultimate abdominal exploration demonstrated a carcinoma of the pancreas. These cases are cited to demonstrate that just because psychic aberrations were noted, they were not cause for the production of somatic complaints.

A recently reported study emphasizes the necessity for adequate control groups.[6] A group of patients with viral hepatitis were used as controls for studies on social and emotional aspects of certain "psychosomatic illnesses." Observation of this "control" group indicated that one-third had grown up in broken homes, that failure to achieve goals was common in the group, that 7 of the 17 married subjects either had been separated from their wives or had seriously considered separation, that the group exhibited personality patterns that conformed to those described in several psychosomatic illnesses, and that mother was dominant more often than was father. Of particular interest, however, was the fact that 18 of the 25 patients had histories of various kinds of acutely disturbing emotional experiences four to nine weeks before the onset of the hepatitis. To control this "control" group in regard to antecedent episodes, 10 patients with acute appendicitis and 10 with pneumonia were studied with precisely the same findings. The investigators' interpretations were as follows: (1) acute emotional distresses may be important determinants of "resistance" in a variety of disorders, or (2) such episodes are a part of the living process and are chance occurrences only temporally related to the onset of the illness.

The point is surely well taken in the conclusions that control observations are just as important in psychosomatic research as in any other investigative studies.

A second pitfall is the attitude of many physicians when confronted with the patient presenting vague and undefinable symptoms that fit nothing in the textbook. The patient must have a "psychosomatic disease." This usually represents a rejection of the patient. It is really a confession of ignorance on the part of the physician. Many types of illustrative cases can be given. To cite one, a 55 year old woman had had recurrent abdominal pains with bouts of diarrhea for a period of two years. Repeated laboratory and roentgen-ray studies yielded no information of diagnostic import. The internist caring for the patient repeatedly emphasized that this must all be a psychosomatic disease, for the patient had an "unstable background." In essence, it was said that nothing could be found; therefore, the condition must be psychosomatic. Finally, when the patient began to lose weight and developed a mass in the abdomen, it became apparent that her symptomatology was not psychosomatic. She died with a carcinoma of the colon with widespread metastases.

One frequently hears patients say, "My doctor says it is psychosomatic." This seems to be a fashionable and well-accepted statement to be made, but it really says little. I have the impression that often these statements are made because the physician is not completely aware of what goes on in the individual's body and that, in essence, he professes his ignorance of a potential underlying disease. There is the oft-repeated statement that the patient has "a large functional overlay," and this can probably be said of any patient with any illness. If we hold that the separation of psyche and soma is not tenable, then such statements assume even less importance.

There is a syndrome often encountered that I like to call the "wolf syndrome." This concerns the patient who goes from physician to physician—the patient with the clinic record that is measured in pounds rather than in pages. A variety of complaints, all without obvious organic basis, are recorded and little, if anything, is done for them. When the physician new to the clinic encounters such a patient, the tendency is just to refill the prescription for phenobarbital or tincture of belladonna and send the patient away. The chart reads: "This patient continues to complain of the same old things." But such patients turn up with disease ultimately. There was a patient I saw recently who after 20 years of repeated trips to various physicians, after seven operations, including complete resection of pelvic floor organs, ended up with lymphosarcoma, which had been overlooked for a year because of the frequent "wolf" visits to the physician.

The third pitfall that impresses me is that not enough attention is paid to the effect of soma on psyche. We are constantly alerted to the effects of frustration, fear, anxiety, and fright on the production of disease, on the perpetuation of disease, and on the exacerbation of symptoms. I do not think that enough attention has been paid to the effect of disease on the person. It is not just the human frame that is stricken with an illness, it is the total patient, the patient with social, economic, and emotional factors in his background. Particularly does one note the effect of soma on psyche in patients with chronic illness, for example, those with rheumatoid arthritis. The public knows much of this disease—the potentials, the good as well as the bad. Surely these patients are entitled to be depressed from time to time

thinking of their inability to participate in activities to which they are accustomed. In managing patients with such illnesses, we must make more use of our social agencies, our agencies for rehabilitation, and all means at hand to give these patients as useful a life as we can with the illness that plagues them. This will serve as good insurance for a healthy psyche in a patient with a chronic illness. But chronic illness is not the only type that may produce disastrous effects on the psyche. The previously healthy wage earner who is suddenly stricken with a myocardial infarct experiences many anxieties. Chief among these are the anxiety of death and the anxiety of his being removed as a wage earner from his family. Sympathy and warm understanding of his problems and attempts to rectify those "extra medical" problems that can be helped will aid immeasurably in the patient's recovery not only of his soma but of his psyche as well.

It cannot be emphasized too strongly that the tendency to concentrate on psyche at the expense of the soma has brought disastrous results in many patients. We are well aware of the many reports of brain tumors masquerading with psychic complaints. The same holds true for pancreatic neoplasm, particularly because of the vagueness of its symptomatology, and for other neoplastic disease. These must all be kept in mind when dealing with the patient with what appear to be principally "functional complaints."

No attempt is made to offer solutions. I have tried to point out some of the problems that exist and some of the areas of misunderstanding. Much work remains to be done. The internist and the psychiatrist must work together more in a consulting capacity. The internist should not set himself up as an amateur psychiatrist. He must set himself up as a complete physician. If he is confronted with a patient with a lung abscess, he commences his medical management and shortly thereafter calls the surgeon for consultation. There are several potential avenues to pursue. The patient may, in rare instances, require prompt surgery, he may require prolonged medical management and then ultimate lobectomy, or he may be cured by purely medical means. But the internist consults with the surgeon, and together they decide on the plan of attack. Perhaps the surgeon will have to be called in again at a later date, but the two are working together. How much simpler it would be if the internist would use the psychiatrist more freely in a consultative capacity, if the psychiatrist, in turn, could see the patient and discuss with the internist what the internist can and should do and what the psychiatrist may have to do in the future. The internist must recognize where he needs help with the patient's psyche, just as he recognizes where he needs help with the patient with lung abscess. This refers to the patient with or without organic disease. An attitude seen too frequently in the internist is that after many frustrating sessions with his patient, during which he seems to be accomplishing little toward ending the complaints, the internist, in a somewhat derogatory fashion, says, "I am now going to send you to a psychiatrist." This is usually issued as a statement of condemnation and, unfortunately, is so interpreted. Just as the internist works diligently by improving the depleted plasma protein, by correcting the anemia, and by clearing up as much infection as possible to prepare his patient with a lung abscess, to make the operation easier for the surgeon, and to facilitate recovery from the ultimate lobectomy, so must he prepare

his patient for psychiatry when he feels that such is the help needed. This may require the utmost tact and skill, but they are traits that all internists would do well to have.

I have previously mentioned that more consideration must be given, not only on the part of the psychiatrist but also on the part of the internist, to the effects of the soma on the psyche.

The excellent studies on the effect of psyche on bodily functions must be continued. Furthermore, the effect of psyche on the course of disease and on the causation of diseases must be continued, be this performed by the internist, by the psychiatrist, or by the "psychosomatist." Over and above this, all must recognize the concept of the total patient with all of its ramifications, with his emotional, his economic, his cultural background, his social place in the community. Full use of all skills and disciplines, including psychiatry, internal medicine, and social services must be brought into play. In so doing, the complete physician will not set up the arbitrary and artificial separation of psyche and soma.

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Postgraduate Assembly of the Endocrine Society

On October 21–25, 1957, the Ninth Postgraduate Assembly in Endocrinology and Metabolism, sponsored by The Endocrine Society, the Medical College of Georgia, and The Medical College of Georgia Foundation, Inc., will be held in Augusta, Georgia. The program will cover the various endocrinopathies, with emphasis on the clinical aspects, demonstration of laboratory tests, presentations of cases, and question and answer panel discussions. The course is designed to cover the main aspects of diagnosis and therapy in the field of endocrinology and metabolism for the physician in general practice and for those in other specialties who wish to have a general knowledge of this rapidly growing field.

For further information concerning the program and registration, write to Dr. Robert B. Greenblatt, Department of Endocrinology, Medical College of Georgia, Augusta, Georgia. Registration is limited to 100; tuition fee is $100.00. Rooms will be reserved for the students and faculty at the Bon Air Hotel. Residents and fellows will be admitted for $35.00.

The Psychiatric Management of Duodenal Ulcer

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The vast majority of ulcer patients will always be seen by the internist or by the general practitioner, whose psychiatric experience is necessarily limited. It is the rare patient who is treated by a psychiatrist. Although there is little evidence that extensive psychotherapy benefits the ulcer patient beyond the time when he is actually in treatment, this of course is equally true of the patient who is medically treated. Many internists, however, seem to have a curiously paradoxical attitude toward psychologic factors in duodenal ulcer. Even the most physiologically minded physicians concede the importance of "mental rest," "forming good habits of working and living," and "emotional calm" in any thereapeutic regimen.[1] Yet, medical investigators often repudiate psychiatric studies by insisting that the psychiatrist is trying to prove that the "cause" of ulcer is essentially psychologic.[2] It is clear that the cause of duodenal ulcer is unknown. This applies to physiologic as well as psychologic factors. However, certain drugs and palliative agents are used in medicine, even though they do not absolutely alter the basic cause of a disorder. The fact that certain psychiatric syndromes may occur with other ailments than duodenal ulcer does not necessarily mean that they are merely incidental to the exacerbations of ulcer with which the internist is confronted.

The psychosomatic approach is a method of medical investigation that adds a psychic dimension to the nonpsychologic factors present in any adaptive response of the organism. From this viewpoint, psychiatry can supply a rational basis for the management of patients with duodenal ulcer corresponding to the various medical procedures. Instead of the doctor's restricting himself to general admonitions about mental rest, and so forth, accurate, detailed psychosomatic formulation can provide for more serious emphasis on psychologic components of treatment.

REVIEW OF PSYCHODYNAMICS

The psychodynamics of any patient can be described by using the psychosomatic formulation. This means that any emotional factor that operates in a patient at the time of either the onset or exacerbation of duodenal ulcer may be formulated by a quadrilateral approach through his (1) conflicts, (2) ego defenses, (3) predominant affects and fears, and (4) pattern of interpersonal relationships. The latter includes his relationship to his physician, often called transference.

The following observations are based on a series of 6 adult males with duodenal ulcer who were chosen from a larger series of 65 patients for detailed investigation of the emotional factors in operation at the time of ulcer recurrences.[3] One patient was treated by psychoanalysis over a three year period. The others were seen in psychoanalytic psychotherapy for 25 to 100 interviews. Although these patients

varied considerably in their personalities and life situations, their psychosomatic formulations disclosed significant common features.

Conflicts. In all 6 patients the nuclear conflict was based on variations in the struggle between activity and passivity. The patients fluctuated incessantly between active controlling and passive yielding, being drawn first to one and then to the other. The pleasurable possibilities entailed in either yielding to complete passivity or attaining an ideal of utter independence were neutralized by fear of certain painful consequences. The transformation from passive and submissive tendencies to the active, assertive pattern came about in three ways: by a transgression of the exaggerated ego ideal, by a lack of fulfillment of passive-receptive wishes, and by a fear of passivity itself.

The model of behavior, thought, or accomplishment that a person is compelled to follow in order to avoid a sense of failure is called the ego ideal, and in these patients it was excessively high, even in those without unusual talents or ambitions. The reaction of despair was frequent when self-sufficiency was challenged, when a source of love and admiration was lost, or when patients found themselves in a passive and depleting predicament. The so-called typical self-reliance, ambition, and independence of ulcer patients was a secondary phenomenon, although it often was the only conscious aspect of the conflict when the patient first came into therapy. Some patients were competitive and independent, but their basic ambition, it was discovered, was not so much for independent achievement as for the right to be passively loved and sustained with unique, noncompetitive, inexhaustible devotion.

Predominant Affects and Fears. Almost always, exacerbations of ulcer were associated with restrained resentment. Complete discharge of anger often temporarily relieved the ulcer pain, even when guilt followed in its wake. Still it was difficult for the patients openly to express anger. Part of this was due to their ego ideal, which usually prohibited overt expressions of anger. Another source of suppression came about through various fears. Chiefly, these included fears of exposure, depletion and exhaustion, coercion and desertion, humiliation and depreciation. The fear of depletion and exhaustion was based on the conflict over passivity itself. A fear of helplessness also appeared when the patients were confronted with a potential loss of a source of love, support, or esteem. A few patients developed recurrence of ulcer symptoms at moments of success or achievement, rather than at periods of obvious loss. Closer investigation indicated that to such patients, success, promotion, or acclaim exposed them even more to potential hazards. In all, there seemed to be a basic fear of being helpless and submissive, with defenses torn away by injuries to their self-esteem or by exhausting, unreasonable demands on the part of those to whom they looked for support. This, coupled with impotent rage, distinguished the ulcer exacerbation from the dominant emotions that occurred during other crises.

Ego Defenses. The unique manner in which conflict is resolved or avoided under various circumstances is a function of the adaptive or defensive capacities of the ego. Some ulcer patients reacted to coercion by automatic compliance; others, by undisguised rebellion. Few resorted to the defense of apathy or indifference when threatened. In this series, critical situations were avoided by various means of escape and by social withdrawal, but there were no instances of depersonalization or emotional isolation. In general, whatever control these patients felt to be exerted on

them was managed by "pseudocompliance," which is the conscious restraint of resentment in the guise of obedient acceptance of circumstances. Under such conditions, it is clear why ulcer patients frequently use the defense of denial by word, act, or fantasy. Exaggerated daydreams of achievement provided several patients with the consolation of unshared, imaginary adulation that they could not receive in everyday life. There was also a tendency, despite the high value each patient placed on masculine self-reliance and independent activity, to find themselves thrust into a passive, often feminine role with respect to other men on whom they depended. Despite conflict, the feminine role had a certain appeal, and in some respects patients envied the privileges that women are granted in our society. Neurotic symptoms were frequent, but no exacerbation occurred when the patient was depressed. Obsessional thinking, acting out through alcohol, and sexual promiscuity were common, and a few patients showed conversion symptoms.

Interpersonal Relationships. It is in the lifelong pattern of the patient's interpersonal relationships that the physician will discover the role in which the patient places him. None of the patients had a wholly satisfactory relationship with his father, for example, although each yearned for a close attachment to an older man who would be at once trustworthy, strong, and capable. Men in authority were mistrusted as being coercive and dictatorial, while ineffectual men were regarded with contempt. As a result, two general forms of transference developed in these patients, based on their characteristically ambivalent attitudes toward men. The physician was often considered to be an ideal parent, both mother and father, benevolent, accepting, and replenishing. But he was equally viewed as a domineering, unsympathetic, relentless manipulator who experimented with human feelings. Some patients reacted to the physician with compliance, obediently following all requests, uncritically agreeing with all his observations. Others, in contrast, were openly defiant. They belittled his knowledge, failed to carry out recommendations, and rudely told him what treatment to prescribe. They rationalized their shortcomings and denied both their latent fear of the physician and their disappointment when he failed to fulfill their expectations. The use of ego defenses such as denial, repression, projection, and displacement frequently prevented patients from recognizing their intense ambivalence toward the physician.

APPLICATION OF PSYCHODYNAMICS TO PSYCHIATRIC MANAGEMENT

The goal of both medical and psychiatric management of duodenal ulcer is the same: shortening the course of exacerbations and lengthening the symptom-free intervals. Hence, it is with the management of recurrences during the acute phase and during the interval phase that psychiatry is concerned.

Acute Phase.

INITIAL CONTACT. The mere knowledge that they have a duodenal ulcer will distress many patients, no matter how carefully this information is presented. The exaggerated self-image of some patients leads them to consider any illness as synonymous with weakness and as a sign of vulnerability. Families who depend on the patient will often refuse to accept the illness. While the patient may agree with the

family in minimizing his symptoms, he may also secretly resent their lack of sympathy. In one sense, if the ulcer can be interpreted as something trivial, such as a temporary reaction to overwork, then there is little or no need, some patients think, to follow a careful medical program. At the other extreme, the diagnosis of ulcer may be seized upon by certain overworked, unappreciated people as a face-saving device for failure, and no amount of medical treatment will erase the secondary gain they derive from being sick.

In the initial contact with the patient, both extremes must be avoided. Information about the ulcer can be conveyed to the patient with full recognition that treated patients have fewer recurrences than untreated and that the frequency of remission or predisposition to relapse is not solely determined by anatomic factors. Although ulcer patients are in need of emotional support and care as part of their medical treatment, such support must be consistent with their psychodynamics. Ulcer patients need to preserve their sense of pride and independence, largely because of the fear of weakness and disability implied in giving in to passive trends. This is clearly indicated by various reactions to accepting the physician's orders. Too many restrictions may arouse the patient's resentment and defiance, even though superficially he may seem cooperative. In contrast, too much latitude may convince the patient who seeks a strong, supportive figure that his physician is weak or ineffectual, perhaps just as torn by doubt and vacillation as he is himself. The ideal physician-patient relationship is one in which the physician is a benevolent authority who supports but does not order. He recommends but does not demand. He knows but is not omniscient. He cares but is not alarmed. He is realistic but is not pessimistic. He does not "take over," but at the same time does not expect more than the patient can accomplish. Treatment is a joint enterprise, combining paternal decisiveness in the physician with recognition of the patient's need for autonomy and freedom of action.

The emphasis is placed on recommendations rather than on unequivocal rules that must inevitably be broken by patients who cannot tolerate submission. Approval of the patient's willingness to follow regulations is important because of the implication that this is a matter of choice rather than of obligation. The attitude of the patient may be benefited if the physician explicitly indicates that his recommendations are only means of fortifying the patient for future independent activities, rather than methods of restricting his life or augmenting his potential invalidism. The physician who enables his patient to recognize that proper adherence to certain measures will not deplete or weaken him, but in fact will make him even more effective, is operating in accordance with psychodynamic observations. Potential health rather than chronic vulnerability is the attitude to be encouraged.

The psychiatric aspects of management may require some modification of the medical program.

A 36 year old working man had suffered with duodenal ulcer for seven years. He was considered uncooperative because of his capricious dietary habits, excessive drinking and smoking, and refusal to follow the physician's recommendations. Although the symptoms were often incapacitating, the patient belligerently opposed all efforts to gain his cooperation.

A series of psychiatric consultations indicated that beneath his aggressive independence the patient was

convinced that because he could no longer eat and drink freely, he was doomed to chronic invalidism. It was also noted that despite his fractious attitude he grasped almost pathetically at even mild encouragement by physicians in whom he had confidence. However, he regarded each temporary remission as a cure and as a restoration to his previous good health, which he could promptly abuse again. The disdain that the patient felt toward arbitrary dietary regulation was explained when he reported his discovery that ulcer pain could be relieved more promptly by smoking a large black cigar and drinking several cups of hot coffee than by following the usual milk and antacid medication. The cigar and coffee were, to him, tokens of health and masculinity; the milk, alkalis, and enforced dietary regulation, evidence of weakness.

In the early phases of medical treatment of this patient, it was imperative not to forbid the use of cigars and coffee, however inadvisable medically. Later, when it was possible to understand why his masculinity was so precariously dependent on such fragile symbols and when the physician was divested of some of his seemingly coercive features, the patient surrendered these harmful habits in the interests of health. He could accept that instead of preserving his independence, strength, and masculinity, promiscuous dietary indulgence actually was preventing his return to more normal activity.

Hospitalization. In the large majority of cases, symptoms rapidly abate when bedrest in a hospital is ordered, although this probably does not alter the actual time in which an ulcer heals.[2] There is some evidence that hospitalization alone is at least as effective as medical treatment in relieving symptoms.[4] It is possible that an important therapeutic factor is the patient's knowledge that he is being treated with interest and concern.[5] This factor may explain some of the optimistic results that are obtained with many therapeutic innovations.

Enforced rest or hospitalization frequently relieves the conflict between active efforts and passive goals. Sometimes, however, if the patient permits himself complete rest, outside pressures may enhance his inner conviction of failure or weakness. If the decision for hospitalization is taken away from the patient, the responsibility for giving in to passive-receptive needs is assumed by the physician. The patient recognizes illness and, with the physician's collaboration, finds it at least temporarily acceptable.

Investigation of Emotional Factors. The crucial events associated with ulcer exacerbations are often as obscure to the patient as to his physician. Only about 35 per cent of patients believe that there is a relationship between abdominal pain and the events and emotions of their lives. Of these, only a small fraction have even an approximate knowledge of the actual emotional constellations involved. Genuine insight, which is more than mere assent to general formulations, is the result of painstaking and prolonged investigation and is the desideratum of observation of the patient through one exacerbation after another. If the critical circumstances do not emerge during the initial interview, this does not mean that relevant conflicts do not exist. A careful past history regarding habitual emotional reactions and typical modes of dealing with crises may provide a frame of reference for evaluation of the patient's current adjustment.

Investigation of emotional factors is often handicapped by the patient's fear of weakness, impaired masculinity, or submission. Some observers have noted that the

ulcer patient frequently agrees to psychiatric interviews only when convinced that he is helping the physician, rather than because of his own needs. Thus, during early interviews much attention is paid to the patient's actual accomplishments, meager though they might seem. The exhausting conditions under which he has been struggling should be fully recognized and appreciated. This technique of ego enhancement emphasizes that the physician is aware of the patient's high ideals and need for self-esteem. If the physician can communicate to the patient his feeling that any man would have had difficulties under similar circumstances, he sometimes permits the patient to acknowledge his shortcomings more readily and to disclose areas in which he has been functioning inefficiently or with insoluble conflict.

Another aspect of the psychologic investigation consists of the controlled release of restrained anger. This is more readily achieved in some patients than in others, but the physician should ask himself if the ostensible source of anger is really the important situation, or if this is not more likely a substitute for a more chronic source of conflict. Irritation at one's employer, for example, may be wholly justified, and yet the patient's sensitivity may be determined by an anxious, demanding wife or by an incessant sense of guilt over some personal misdeed. Anger, to some patients, is associated with fear. For this reason, interrogation, however sensitive, may be interpreted as an aggressive act designed to impose unwelcome modes of thought or feeling on the reluctant patient. The area of resentment must be tactfully approached, lest the patient deny all conflict and present himself as the unique, self-sufficient person his self-image requires. In other instances, the physician who too vigorously probes a difficult area will frighten the patient and may himself become the target of the patient's displaced hostility.

Chronic Phase. During the interval period of treatment the patient has returned to his usual way of life. He is often working and entirely symptom-free. As with any person who is afraid of illness, the ulcer patient usually increases his activities in an effort to minimize the restriction that his illness has placed on him. It is extremely difficult to get ulcer patients into prolonged psychotherapy. Part of this is also due to the sometimes unrecognized fact that patients often want so much that they automatically despair of receiving anything, and hence repudiate the physician's efforts to work with them.

A crucial element in the dilemma is the relationship that the physician develops with the patient. It can be a limited relationship in which only topics of diet, antacids, and general advice about living habits are discussed. Or the relationship can be built around the concept of the physician as one who is capable of collaborative efforts to modify certain difficult aspects of the patient's life. The characteristic reaction to the physician, as already indicated, is intensely ambivalent. He must avoid both extremes, if possible: he does not foster dependence by making nonmedical decisions or by being overly solicitous, generous, or conciliatory, for sooner or later, the patient's demands will exceed what the physician can realistically supply. Nor does the physician allow the patient to ignore the prominent emotional aspects of his life, for this implies that feelings and attitudes are of little importance, and both physician and patient realize that this is not the case.

How then should psychologic inquiry be conducted during the protracted period

of follow-up care? We must assume that the patient will return only when his ulcer is causing symptoms. Often admonitions are given about too vigorous probing of the patient's emotional situation. Nevertheless, carefully phrased, sensitive, and supporting questions may be successful in tapping into sources of resentment, frustration, and conflict. Ulcer patients fluctuate widely in their willingness to discuss emotional conflicts. An interview in which the patient readily talks of his problems may be followed by another in which he defiantly or blandly denies what he has said before and even may accuse the physician of putting words in his mouth. Then too, the hostile side of the transference is always present, however well disguised. When this reaction becomes apparent, the physician should immediately cease interrogation and return to discussing the life situation in terms of positive accomplishments, recognition of the patient's ability, and so forth. Deliberate shifting to a neutral topic, particularly one about which the patient knows a great deal, is occasionally advisable. Later, it may be possible to confront the patient with situations that impede his efficiency and inquire why it is that when so many other situations are managed well, this one gives him difficulty.

The key formula for understanding ulcer exacerbations is based on the observation that symptoms most often recur when the threat of depletion exceeds the promise of replenishment and the angry protest is restrained. However, in our therapeutic enthusiasm, it is wrong to apply this general interpretation uncritically to all patients. For example, vigorous urging of a reluctant patient to express his anger may be disastrous. He may become depressed, confused, or simply break off treatment. It is more important to discover and help the patient to use other forms of ego defenses besides inhibition of affect, projection of guilt, displacement of resentment, or escape through global denial of conflict.

Sometimes the psychiatric management of duodenal ulcer has been misunderstood to mean educating the patient with respect to certain academic relationships between the mind and the body. This is not likely to be helpful. It does not convince the resistant patient that his problems, if any, are associated with his ulcer symptoms. Such patients often consider themselves the "exceptions." Nor does it clarify significant events for the enlightened patient who is already aware of the close relationship between emotions and ulcer recurrences.

GOALS OF PSYCHIATRIC MANAGEMENT

Psychiatry has more to offer than just the method to clarify relationships between conflict, defense, emotions, and symptoms, or to create and sustain an effective physician-patient relationship. For example, which ulcer patient should be referred to a psychiatrist for prolonged treatment? Psychotherapy is primarily concerned with the patient's personality, not with the ulcer. If the patient has clinically active psychoneurosis or psychotic trends, with symptoms that impair his attitudes and activities, apart from his ulcer, then psychiatric treatment is indicated.

As there are various goals in psychiatric treatment, ulcer patients are managed in different ways.[6] Psychodynamic clarity does not necessarily imply therapeutic optimism. It merely provides a basis for evaluation. With some patients, the physi-

cian embarks on a therapeutic voyage with goals of major personality readjustment. With others, the goals are exceedingly limited by the patient's crippled personality, his insurmountable life situation, or other restricting elements not necessarily connected with the severity of the ulcer. The prognosis in psychotherapy varies with the goals the physician sets or, more accurately, the goals that are often forced on him. A serious, seemingly impossible life situation is not always associated with a poor prognosis. Environmental difficulties represent only the external component of a total conflict. More important is the type of conflict, and still more important is the subjective element, not only how effectively the patient functions in most areas of his life, but how intense is his motivation toward overcoming difficulties. The degree of secondary gain or inner satisfaction that some patients derive from remaining in an ostensibly painful situation may, however, neutralize a professed drive toward health.

Another moot question for both psychiatry and medicine is to what extent personality problems constitute a contraindication to surgery. In a small series of cases, it was noted that patients with chronic duodenal ulcer developed psychiatric symptoms after gastric resection, particularly when the operation had relieved the ulcer symptoms.[7] This indicates that, in accordance with theoretical expectations, the ulcer symptom serves a defensive function for the patient, such that when this channel of solution is removed, alternative avenues of symptomatic expression are opened. It is evident that the ulcer should not have too much emotional significance for the patient if he is to be operated on. Certainly, surgery does not cure the patient of the emotional hazards that have contributed to the chronicity of his complaint. Careful application of psychodynamic principles, incorporated into medical treatment, may still increase the duration of symptom-free intervals and diminish the incidence of passive, dependent invalidism.

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Physiologic Mediation of Psychic Stimuli in Diabetes Mellitus*

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The maintenance of normal somatic and psychologic functions requires the reception and integration of sensory stimuli, their intellectual and emotional evaluation, and their transformation into movement or secretory activity. Thus the "mind" becomes an integral part of homeostasis and plays an important role in the pathogenesis of disease. The nature of these psychosomatic relationships is becoming more clear as a result of varied and intensive investigations, some of which date as early as the seventeenth century when Thomas Willis, describing the sweet taste of diabetic urine, said that the disease was due to "prolonged sorrow." One type of investigation is concerned with the study of personality patterns in diabetes. According to Dunbar,[1] for instance, the diabetic patient suffers from a conflict between hatred and submission to parent figures and from inadequate sexual adjustment. This interesting hypothesis, illustrated by selected case histories, is based on "proof by examples," which cannot be considered conclusive and could not be confirmed by a recent study of Kubany, Danowski, and Moses.[2] These authors, although recognizing that "diabetes mellitus produces many psychologic problems which may result in abnormal behavior . . ."[3] were unable to find any intelligence or personality pattern characteristic of the diabetic patient. Anxiety, fear, and other psychologic problems created by the awareness of chronic disease not only may create obstacles in the path of therapy and indirectly affect the disease itself,[4, 5] but may influence its basic pathogenesis, resulting in a mutual interplay of disease and emotional state that has been called the "psychobiologic constellation."[6] Hinkle and Wolf[7] studied the marked effects of experimentally induced emotional trauma and of stressful life situations on the course of diabetes. These authors observed that a metabolic pattern characterized by decreased carbohydrate tolerance and ketosis occurs in prolonged fasting, and they suggested the interesting hypothesis that diabetes mellitus may be the result of inappropriate adaptive mechanisms to symbolic starvation, such as real or imaginary loss of affection and emotional support or threats to the patient's security. A striking example of repeated episodes of emotionally induced diabetic coma was reported recently.[8] Another line of investigation, based on the classic observations of Pavlov, Cannon, and Selye, is concerned with the anatomic and physiologic links that translate psychologic stimuli into somatic effects. This review will summarize briefly some of the recent contributions to this aspect of the problem and discuss the thesis that diabetes mellitus is, at least in part, a disorder of adaptation to emotional or physical stimuli, possibly originating in the neocortex or carried to the neocortex by afferent pathways. According to this

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hypothesis these stimuli would descend from the neocortex to the phylogenetically older limbic system and from this to the hypothalamus, the pituitary, and other effector organs via nervous or humoral transmission. Thus fright, emotional upheavals, distressing memories, or physical insults would cause autonomic responses (pallor, blushing, sweating, elevation of blood pressure, syncope, tachycardia, bronchial or intestinal spasm) or endocrine disturbances, such as changes in diuresis and ovulatory cycle, dysmenorrhea, hyperfunction of thyroid and adrenal cortex, increased secretion of epinephrine, hyperglycemia, and glycosuria. In turn, these autonomic and endocrine responses may be a source of anxiety[9] and of physical stress, and a vicious cycle may become established.

THE NERVOUS PATHWAYS TO THE HYPOTHALAMUS AND THE HYPOTHALAMO-ENDOCRINE INTERRELATIONSHIPS

According to some investigators[10–12] the major pathways through which environmental and psychic stimuli may reach the hypothalamus derive from: (1) the hippocampus, (2) the piriform lobe, (3) the cingular gyrus, anterior insular and orbitofrontal cortex, (4) the amygdala, and (5) the globus pallidus. The first four of these structures are part of the so-called limbic system,[13, 14] which, receiving neocortical afferents, may function as a bridge between neocortex and hypothalamus through which emotional stimuli may activate the endocrine system. In addition, the hypothalamus gives rise to hypothalamo-cortical pathways, providing the anatomic basis for reverberating circuits and feed-back mechanisms. From the hypothalamus, stimuli may reach the periphery either through the autonomic nervous system or through the endocrine glands. Evidence for direct effects of the central nervous system on the secretory activity of the islets of Langerhans and on the regulation of blood sugar levels has been discussed elsewhere,[15, 16] and although the function of pancreatic innervation in the adjustment of blood sugar level appears to be an accessory rather than a necessary one, the possibility that this innervation may cause temporary changes in diabetes cannot be denied a priori. In contrast with this uncertain role of the nervous system in the regulation of the endocrine functions of the pancreas, emotional or somatic stimuli carried by the splanchnic nerves to the adrenal medulla cause an increase in secretory activity resulting in hyperglycemia and, sometimes, glycosuria.[17] The great sensitivity of this mechanism is indicated by the recent observation that the relatively minor stress of awakening from a normal sleep may cause a 40 per cent increase in the epinephrine concentration of venous blood.[18] In addition to the pancreas and the adrenal medulla, the hypothalamus sends stimuli also to the anterior pituitary. Recent investigations indicate that normal pathways between hypothalamus and pituitary seem to be required for a regulated secretion of thyroid-stimulating hormone (TSH) and for a normal TSH response to cold and anesthesia.[19] In addition, there is evidence for the existence of a hypothalamic center or centers controlling thyroid growth and ACTH secretion.[20, 21] The stimulation of ACTH secretion by physical or mental stress is a well-known phenomenon and has been confirmed recently by studies of adrenal steroids in blood and urine.[22–27] The function of the central nervous system in

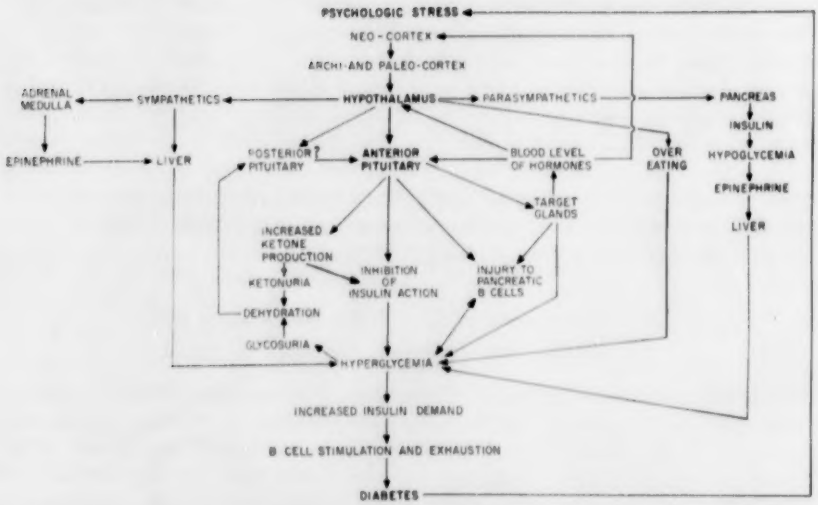

FIG. 1. Diagram showing how the hypothalamus may mediate the somatic manifestations of emotion.

ACTH release is demonstrated also by the following observations: (1) venous blood from the brain of stressed hypophysectomized rats causes eosinopenia in normal rats;[28] (2) midbrain decerebration reduces the concentration of aldosterone and hydrocortisone in the adrenal blood;[29] (3) reserpine, a diencephalic ataraxic[30] and injury to the supraoptic-hypophysial tract[31] inhibit stress-induced ACTH secretion; and (4) stimulation of the anterior hypothalamus in man causes an increased output of adrenal steroids.[32] There seems to be little doubt that the hypothalamus is largely responsible for regulating the secretion of follicle-stimulating hormone (FSH) and luteotrophic hormone (LH), which may explain the effects of courtship, sex display, and other environmental, sensory, and psychic factors on ovulation, on menstrual cycle, and on the activity of the reproductive organs in general.[10, 11, 33, 34] The mechanism of this hypothalamic control of the anterior lobe of the pituitary has not been elucidated completely, although most investigators believe that it depends on a humoral mediator reaching the gland via its portal vessels.[34] This hypothesis is based on the following evidence: (1) section of the pituitary stalk causes a reduction in FSH, ACTH, and TSH secretion, if the regeneration of the portal vessels is effectively prevented; (2) anterior pituitary glands that are transplanted to a site where they become revascularized by portal vessels show normal activity; (3) anterior pituitary glands transplanted elsewhere grow, but function at a reduced rate; and (4) tissue cultures of anterior pituitary cease to produce ACTH after four days of incubation, but resume its production if fragments of hypothalamic tissue or hypothalamic extracts are added.[35] The nature of the hypothalamo-hypophysial humoral mediator is debated: some investigators[36, 37] suggest that it might be identical to the posterior pituitary hormones secreted under a number of nervous

and emotional stimuli[38] by the cells of the supraoptic and paraventricular nuclei,[39] while other investigators[38] believe that the hypothalamus secretes a specific neurohumoral transmitter (or transmitters). Evidence that the hypothalamus may contain centers regulating food consumption and body weight is also available[40] and is of interest in view of the relationship between diabetes and obesity.

EFFECTS OF THE ANTERIOR PITUITARY AND ITS TARGET GLANDS ON DIABETES

The classic experiments of Houssay and others have demonstrated that hypophysectomy leads to "amelioration" of pancreatic diabetes, while the administration of anterior pituitary extracts (APE) causes impairment of glucose tolerance, increased insulin resistance, and, sometimes, ketosis.* This disturbance may be either temporary (idiohypophysial diabetes) or permanent (metahypophysial diabetes). Pituitary diabetes in the normal animal or aggravation of existing diabetes in the alloxanized animal can be obtained also with purified pituitary hormones, such as growth hormone (somatotrophic hormone or STH), adrenocorticotrophic hormone (ACTH), and prolactin. The mechanism of action of these hormones has been discussed extensively elsewhere[41] and is not fully understood. STH may cause hyperglycemia by injuring the insulin-secreting B cells of the islets of Langerhans, by stimulating glucagon secretion, or by bringing about an insulin-reversible inhibition of glucose utilization; ACTH and the adrenal cortical hormones (ACH) may enhance the effects of STH and glucagon or inhibit glucose uptake by the tissues directly. In any case, chronic hyperglycemia would result, leading to increased insulin demand, to excessive stimulation of the islets of Langerhans, and to their final exhaustion. In addition, ACTH and ACH may cause a decrease in the supply of SH- groups available for the synthesis of insulin and necessary for the activity of several enzymes of carbohydrate metabolism. Prolactin may have an action similar to that of STH and ACTH, and the sequence of decreased pancreatic reserve, increased insulin demand, stimulation and exhaustion of the B cells may apply to this hormone also. A possible role of the gonadotrophins in diabetes is suggested by the observation that androgens increase the incidence and severity of diabetes in rats, that certain derivatives of progesterone also have a diabetogenic effect, and that the administration of estrogens at first causes hyperglycemia and glycosuria followed, with prolonged treatment, by improvement of the diabetic syndrome. In addition to the vicious cycle of hyperglycemia, increased insulin demand, pancreatic stimulation, pancreatic exhaustion, hyperglycemia, other effects may be set in motion by an excessive stimulation of the anterior pituitary. For instance, STH and ACTH may stimulate the formation of ketone bodies by the liver,[42] ketosis may stimulate the secretion of ACH,[43] and these, in turn, may aggravate the syndrome and, possibly, contribute to some of its complications.[44] Diabetes may also be influenced by epinephrine, which, on the one hand, causes hyperglycemia by stimulating liver glycogenolysis and, on the other hand, stimulates the secretion of ACTH and adrenal cortical hormones.[45] The hormones of the posterior pituitary also cause hyperglycemia, but only in very

* For an extensive bibliography the reader is referred to two recent reviews: references 15 and 41.

large doses. However, it is possible that when dehydration due to excessive glycosuria and ketosuria stimulates the hypothalamic osmoreceptors, the excessive production of antidiuretic hormone may stimulate the anterior pituitary and further aggravate the situation.

CONCLUSIONS

The hypothalamus appears to mediate the somatic manifestations of emotion, not only by regulating autonomic reactions such as pallor, blushing, tachycardia, rise in blood pressure, sweating, tremors, and increased smooth muscle activity, but also by activating the endocrine system. In this manner, anxiety and other psychodynamic forces may cuase somatic changes and precipitate or aggravate acute or chronic illness, the awareness of which, in turn, may become a source of anxiety. The participation of the hypothalamo-hypophysial system, capable of regulating a multitude of functions, may explain the great variety of organic and functional changes that can be precipitated by psychogenic stimuli and offers hope for a better understanding not only of the relationships between psychoendocrine and other psychosomatic phenomena but of psychologic processes in general.

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Psychiatric Aspects of Diseases of the Eye, Ear, Nose, and Throat

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Beginning with the unicellular organisms and ascending the phylogenetic scale, one finds an ever-increasing development of the organs of special sense. By means of these organs the animal is enabled to become aware of the nature of its environment. Again, as we ascend the phylogenetic scale, we find an ever-increasing capacity in the organism for assimilating the information brought to it by the special senses and coordinating this information into a kind of knowledge or awareness that may be used to guide or direct the behavior of the organism.

In man one finds in operation an attempt not only to understand his environment but to modify or change this environment for his own betterment. Because of man's recognition of his helplessness and weakness in his solitude, he has become a social being and has allied himself with others of his kind in various social aggregations. This has been done to increase his capacity for helping himself through the additive strengths, information, percepts, concepts, and judgments of others.

The society he has thus created helps man, but it also makes new demands on him. He must now obey new rules imposed for the preservation not only of the individual but also of the group. These demands must be met through new uses and applications of the special senses and the development of a high form of communication. By this communication we keep ourselves informed not only as to the state of the static environment surrounding us, but also as to the dynamics of the fluctuant past, present, and future environment composed of the interrelationships with other human beings.

Since in the social group we have become dependent on one another and since the fulfillment of this dependence is the function of communication, it is then seen that communication itself has become one of the basic attributes of what we have agreed to call "human." Communication is mediated by the special senses, whether it be by gesture, facial expression, posture, or symbol, or whether it be by means of that strange aggregation of grunts, coughs, coos, and whistles that we call "verbal language." Save for the finer discriminations of tactile sensibility, all the organs for special sense, taste, sight, olfaction, and hearing are located in the region of the eye, the ear, the nose, and the oral cavity. By extension, we may say that all organs for the reception of communication are located in these regions. Verbal speech for the purpose of expressive communication is mediated through the organs of the mouth and throat.

The question should now be raised, "Does disease of these particular areas, through impairment of sensual communication, have special emotional meaning for the patient?" Not only our clinical experience but laboratory studies indicate that impairment of communication has profound emotional meaning for the individual.

One study of great interest was reported by Hebb. Hebb prefaced his description of the experiment by saying, "This experiment is too cruel to do with animals, but not with college students." He continued:

> The subject is paid to do nothing 24 hours a day. He lies on a comfortable bed in a small closed cubicle, is fed on request, goes to the toilet on request. Otherwise he does nothing. He wears frosted glass goggles that admit light but do not allow pattern vision. His ears are covered by a sponge rubber pillow in which are embedded small speakers by which he can be communicated with, and a microphone hangs near to enable him to answer. His hands are covered with gloves, and cardboard cuffs extend from the upper forearm beyond his fingertips, permitting free joint movement but with little tactual perception.

One can recognize from the foregoing quoted passage that in Hebb's experiment he is producing a laboratory version of a sensation-free nirvana. At first this created situation perhaps might be considered a pleasant and restful state, welcome in its freedom from external noise or disturbing visual and tactual stimuli—a silent, gray-white nothingness where the environment no longer intrudes itself on the subject's inner consciousness. How do the subjects really react? The following is what Hebb wrote.

> The results are dramatic. During the stay in the cubicle, the experimental subject shows extensive loss, statistically significant, in solving simple problems. He complains subjectively that he cannot concentrate; his boredom is such that he looks forward eagerly to the next problem, but when it is presented he finds himself unwilling to make the effort to solve it. On emergence from the cubicle the subject is given the same kind of intelligence tests as before entering, and shows significant loss. There is disturbance of motor control. Visual perception is changed in a way difficult to describe; it is as if the object looked at was exceptionally vivid, but impaired in its relation to other objects and the background—a disturbance perhaps of the larger organization of perception. This condition may last up to 12 or 24 hours.

These results are startling enough in themselves, but there are more:

> Subjects reported some remarkable hallucinatory activity, some which resembled the effects of mescal. . . . These hallucinations were primarily visual. . . .
>
> The nature of these phenomena is best conveyed by quoting one subject who reported over the microphone that he had just been asleep and had a very vivid dream and although he was awake, the dream was continuing. . . .
>
> In its early stages the activity as it occurs in the experiment is probably not dreamlike. The course of development is fairly consistent. First, when the eyes are closed the visual field is light rather than dark. Next there are reports of dots of light, lines, or simple geometrical patterns, so vivid that they are described as being a new experience. Nearly all experimental subjects reported such activity. (Many of course could not tolerate the experimental conditions very long, and left before the full course of development was seen.) The next stage is the occurrence of repetitive patterns, like a wallpaper design, reported by three-quarters of the subjects; next, the appearance of isolated objects, without background, seen by half the subjects; and finally, integrated scenes, involving action, usually containing dreamlike distortions, and apparently with all the vividness of an animated cartoon, seen by about a quarter of the subjects. In general, these amused the subject, relieving his boredom, as he watched to see what the movie program would produce next. The subjects reported that the scenes seemed to be out in front of them. . . .
>
> In their later stages the hallucinations were elaborated into everything from a peaceful rural scene to naked women diving and swimming in a woodland pool to prehistoric animals plunging through tropical forests. One man saw a pair of spectacles, which were then joined

by a dozen more, without wearers, fixed intently on him; faces sometimes appeared behind the glasses, but with no eyes visible. The glasses sometimes moved in unison, as if marching in procession. Another man saw a field onto which a bathtub rolled: it moved slowly on rubber-tired wheels with chrome hub caps. In it was seated an old man wearing a battle helmet. Another subject was highly entertained at seeing a row of squirrels marching single file across a snowy field, wearing snowshoes and carrying little bags over their shoulders. . . .

There were a few reports of auditory phenomena—one subject heard the people in his hallucination talking. There was also some somesthetic imagery as when one saw a doorknob before him, and as he touched it felt an electric shock; or when another saw a miniature rocket ship maneuvering around him, and discharging pellets that he felt hitting his arm. But the most interesting of these phenomena the subject, apparently, lacked words to describe adequately. There were references to a feeling of "otherness," or bodily "strangeness." One said that his mind was like a ball of cottonwool floating in the air above him. Two independently reported that they perceived a second body, or second person in the cubicle. One subject reported that he could not tell which of the 2 bodies was his own. . . .

By now it must be recognized that what have been described are artificial psychoses, reversible it is true, but certainly experiences that in their strangeness, their separation and difference from normal processes cannot be called anything but psychotic. Again, it must be remembered that the subjects in this experiment were supposedly healthy and normally functioning college students. The situation that produced these profound if temporary changes was one in which nothing was done except to isolate the individual from his environment by shutting off the normal inflow of stimuli arising from his organs of special sense, touch, sight, and hearing. There were no pain, no fever, no demonstrable endogenous toxins, and no drugs. It was only that the subjects' contact with the world was severed, but the results were undeniably dramatic.

Fortunately, one rarely encounters in medical practice a patient with a physical disorder proportionately analogous to the sensual isolation experimentally imposed on the aforementioned volunteer subjects. Most patients are able to retrain themselves to overdevelop some special sense to compensate for the loss of another. Classic examples of this lie in the visual lip reading of the deaf and the increased auditory awareness of the blind. Thus, although communicative powers are diminished by the original disorder, they are held at a compensated and workable level by the new skill or developed ability. However, this readjustment frequently is long, arduous, and frustrating. In addition, the disease attacking the special sense organs may have general toxicity as one of its manifestations or may be but a part of a generalized disorder producing widespread symptoms in other parts of the body. There may be severe pain, metabolic and endocrine disturbances with their special and generalized emotional concomitants, either basic or added to the emotional turmoil resulting from the limitation in communication.

I remember a middle-aged Jewish woman who spoke very little English. She sought help for severe pain and diminution of vision in the left eye. Examination revealed a melanosarcoma of the choroid coat. She was advised, through an interpreter, that the eye would have to be removed. She displayed appropriate anxiety and grief, but did not seem unduly disturbed, and she agreed to have the necessary operation. Preoperatively, she seemed tense and anxious but not remarkably upset.

The operation was carried out without unusual difficulty with the patient under

general anesthesia. Immediately after the operation rather heavy sedation was established, so that the patient did not really awaken until around midnight. She found herself in some pain, with both eyes bandaged. Because of the language difficulty, she was unable to communicate verbally with the nurses and attendants. She began to scream and to cry out, tore at the bandages, tried to get out of bed, and became utterly unmanageable. Through an interpreter it was discovered that the patient believed that she was being imprisoned. She feared for her life and was planning to jump from the hospital window to escape from the persecutors of her delusion. She refused to take any sedation orally for fear of being poisoned. Other attempts at quieting her by medication were essentially fruitless.

At last it was remembered that the patient was at first accompanied by a trusted friend who also spoke Yiddish. The friend was brought to the hospital, and when she spoke to the patient and touched her hand, the patient immediately became calmer. She finally agreed to take a sedative agent orally and at last fell into a slumber, holding her friend's hand. The friend remained with her all night, speaking reassuringly to her in Yiddish and patting her hand whenever she awoke. The re-establishment of some form of communication and trust ended the brief but violent psychotic episode.

A personal friend of mine told me the following story. While he was a tank commander in the Battle of the Bulge, he was wounded by a shrapnel fragment that destroyed the right eye and passed through to sever the left optic nerve and embedded itself in the left frontal lobe. When he regained consciousness he realized that he was blind, and almost immediately he was told that his blindness was total and permanent. He was very discouraged and saddened by the news but was able to endure this tragedy. During the next several days of his evacuation to England and thence to the United States by air, he was lying quietly in bed and his only conversation consisted of short "yes" or "no" answers to nurses and physicians who questioned him directly as to whether he was in pain, wanted a cigarette, and the like. Upon his arrival at a receiving hospital in the United States, a Red Cross worker asked him if he would like to talk to his wife by long-distance telephone. He said "yes," and the worker arranged the call and handed him the telephone. To his horror, this patient heard his own voice producing a meaningless gabble of aphasic jargon when he tried to talk in anything but monosyllables. The brain injury had cut this channel of communication also. Fortunately, he obtained almost complete return of expressive speech after several weeks. He told me later that the most depressing and despairing time of his life, and the period most provocative of anxiety, was the interim after the failure at conversation. This was the only time that he had ever considered suicide.

The deaf person has, in some ways, a more serious emotional problem than does the blind person. Blindness is a fairly obvious defect, and those of us who watch the blind person find our human sympathies and our compassionate desires to help immediately aroused. We step forward quickly to help the man with the white cane across the street. This makes us feel good and benevolent. Can we also say that we feel equally charitable and kindly toward the hard-of-hearing person who is constantly asking us to repeat the punch line of our favorite joke, or who remarks

irritably that "everybody mumbles; why don't you speak up?" Because of our own need to communicate our thoughts, and to do so verbally, we at least unconsciously regard the deaf person as one who keeps us at a distance, who really does not want to hear the important message we have to transmit. The deaf person feels this resentment, and his well-known increasing irascibility and belligerence are not entirely a matter of projection of his own problems. However, a degree of such projection certainly is present also. Because of increasing reluctance and sensitivity in regard to asking people to repeat their communications, the hard-of-hearing person begins more and more to try to fill in incomprehensible gaps in the conversation with his own guesses as to what was said. If there is present any significant degree of unconscious paranoid material, it will certainly become conscious in this situation, coloring and flavoring the "filled-in" material that the deaf person has had to supply directly from his own unconscious.

In psychiatric discussions there is much use of the word "stability." This is an interesting word and one that seems to indicate that we associate within us that abstract something known as "emotional stability" with our capacity for orienting ourselves in space. Every psychiatrist has seen the patient in therapy who experiences severe vertigo and a whirling sensation upon the relinquishment of some neurotic stronghold. Conversely, patients with disorders of the vestibular apparatus frequently appreciate their vertigo in terms of the most devastating anxiety, as if the whole world had refused to hold still and be recognized. All familiar objects are whirling and spinning, and the patient literally does not know which way to turn. It has been observed that in those patients with emotional disturbances after the administration of streptomycin, the anxiety was chiefly related to malfunction of the eighth nerve.

The nose and its sense organs are less well understood psychiatrically because the sense of smell is most primitive and has largely been relinquished by the conscious mind. However, there are the deepest unconscious meanings to the sense of smell, chiefly noted in the sexual sphere. One has only to read the names—simply the names—of the most expensive perfumes: "My Sin," "Après Moi," "Tabu," "Ecstasy." Those primarily psychiatric patients with olfactory hallucinations are likely to be the most deeply disturbed, and conversely, those persons with organic parosmias are very likely to be tying their organic disorder to primitive unconscious material and thus seriously complicating their illness.

The unfortunate patient who must undergo laryngectomy or tracheotomy has a special problem in communication. No matter how well he understands the need and necessity for the procedure, it is most difficult for him to anticipate the frustration and resultant rage that attend his difficulty in expressing himself after the procedure. One sees the hopeless shaking of the head and shrugging of the shoulders in futile despair when one tries to talk with such patients. Frequently, one observes striking and hitting gestures punctuating the hoarse, bubbling, and sibilant attempts at speech when the patient recognizes that he has not been able to bridge the gap between himself and others by the old familiar methods of speech. These displays contrast vividly with the bland "belle indifférence" of the patient with hysterical aphonia. Such a patient has produced a symptom that has neatly prevented him

from communicating material that his unconscious censor has told him is more dangerous and isolating than silence. He is content.

Man acquires data concerning the nature of his environment through his special senses. Part of man's particular environment is the society that he has created because of his recognition of his own individual helplessness and weakness. The person can and must be individualized within the group, but he is dependent on the group and must constantly check and evaluate his status through an elaborate system of interpersonal signals, which is referred to as "communication," with its subdivisions of conversation and language. Communication is the golden thread by which the individual finds his way out of the labyrinth of the "aloneness" of the self back to the "togetherness" of close interpersonal relationships with others. The most profound result of the breaking of this thread is seen in the syndrome known as "schizophrenia," which leaves the patient locked inside himself and wandering alone in the maze of his own ego.

Serious limitation of communication has deep emotional effects on any individual, as we have illustrated by the previous review of the work of Hebb and his isolation experiments. Man tests and examines the world outside himself with his special senses and by means of this is able to orient himself in regard to his environment and to relate himself to others.

Disease affecting the special senses, and most particularly disease of sight and hearing, decreases man's capacity for this testing of reality and the capacity for being emotionally together with others. The result is invariably productive of anxiety, at least. If there is special unconscious pathologic ideation within the individual, limitation of his testing of reality and his powers of communication by obtunding his special senses may cause this material to burst forth and emerge as psychiatric symptoms. Diseases that do obtund the special senses are most frequently within the purview of the ophthalmologist and the otorhinolaryngologist.

Psychiatry has been called the "science of sympathy." The psychiatrist's most valuable tool is his ability to observe the patient and ask himself the question, "In this sufferer's position, how would I feel and how would I want to be treated?" This ability or capacity for empathy certainly is not the exclusive property of the psychiatric specialist. Naturally, the psychiatrist in his training and his experience acquires particular skills, knowledge, and information regarding human behavior. Thus, he can be of great use in special and complicated problems and his services should be utilized. However, as all of us as physicians in our humanity become more sensitive to the totality of our patients as human beings, we shall have fewer cases that are hopelessly complicated.

The Management of Anxiety in Medical Practice

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Before launching on what I hope may be a useful discussion of the management of anxiety in medical practice, I should like to take time briefly for some speculations on the nature of this phenomenon of anxiety, which so often needs management. Let me emphasize that these are speculations.

Anxiety, although it has much in common with fear, is not identical with fear. Fear is a primitive emotion. Anxiety is, to a much greater extent, an evolved emotion. At least in time of peace, modern man has fewer occasions for fear than primitive man had, but more occasions for anxiety.

Modern man is often uncertain about the cause of his anxiety, even though his anxiety may be intense. By way of contrast, modern man's primitive ancestor, fighting with the cave bear, was in no doubt as to the cause of his fear. That is to say, his fear had both specific content and specific direction. For while fear is characteristically a response to an external threat to the integrity of the body, anxiety is characteristically a response to an internal threat to the integrity of the mind.

The evolution of the mammal involved an increasing cephalization of function, and the evolution of the human animal has involved an increasing cerebration of function. Responses that at an earlier stage of evolution were more stable and invariable, rigid and automatic have been replaced by a much wider range of responses. This new range involves responses that are more "cerebral," more variable, more flexible, more educable, more differentiatingly adaptive. The cerebral cortex has grown and expanded even more rapidly than the enlarging brain case and lies now, crowded and wrinkled, over nearly all of the brain.

Twenty years ago, George Campion, on the basis of the work of Henry Head, suggested that in the future a thalamocortical circulation of neural impulse would be recognized as being just as important to the physiology of thought as the circulation of the blood is to general physiology. The cerebral cortex has acquired the function of a general staff. It is utilized for the exact and exacting analysis of the sensory information relayed to it from the thalamus. Flexibility and adaptiveness call for a wide range of possible responses guided by imagination and foresight. There is a two-way traffic of communication between diencephalon and cortex, and it appears that this traffic usually results in a resolution of the question or questions referred by the diencephalon to the cortex. This resolution forms a basis for action or nonaction. But it may be that when a question is referred to the cortex, no resolution is reached, or the resolution may not be satisfactory. In such a case, a diencephalocortical circulation of neural impulses may persist or even may build itself up in an increasing fashion to become resonance-like. It is my hypothesis that such an intensifying circuit of neural impulses, with an overflow into the autonomic centers of the hypothalamus, is the neurophysiologic concomitant of anxiety.

For purposes of this discussion, anxiety is an emotion characterized by subjective feelings of uneasiness and apprehension, which often show a tendency to generalize and which are not linked to a clearly recognized external danger or threat.

Anxiety has a function. Decisions made without alertness are often wrong decisions. Anxiety of mild or moderate degree has a function in increasing alertness, effort, and mobilization of all resources to the solution of the question at hand. Anxiety in its purest form is an emotion and a set of coincident bodily changes relating to a state of apprehensive indecision coupled with an inner urgency toward reaching a decision. Such a state, if moderate, facilitates and even forces the review of dangers or difficulties inherent in each of several possible courses of action. If a choice is made, it will be pursued with diligence. If a choice is not made, tension will increase.

Dr. Jules Masserman has stated his principle IV of biodynamics as follows:

> . . . when two or more urgent motivations of an organism are in sufficiently serious conflict for the adaptive patterns attendant to each to be simultaneously called forth and when these are mutually exclusive to the point of a paralyzing impasse, then the organism experiences mounting tension and apprehension reaching various levels of "anxiety," while its behavior, somatic and muscular, becomes progressively more ambivalent, poorly adaptive and ineffectively substitutive (i.e. "neurotic"), or especially in the case of man, progressively more disorganized, regressive and bizarrely symbolic (i.e. "psychotic").

If we are willing to accept the oversimplicity of a diagrammatic picture, we may regard fear as, in essence, the emotion that stimulates and accompanies the impulse to escape, anger as the emotion that galvanizes and accompanies the impulse to attack, and anxiety as the emotion that pushes us toward the resolution of some inhibiting or paralyzing impasse occasioned by a conflict within ourselves. Each of these emotions may serve a biologic function, or may reach a nonfunctional (and thereby morbid) level. Anger may reach the level of a berserk battle-frenzy that does not distinguish friend from foe. Excess of fear may physically immobilize when action is imperative or may result in a blind and perhaps tragic panic of flight. Similarly, excess of anxiety may lead to a paralyzing incapacity to make a decision or to a stupidly bad decision.

Why is anxiety medically important? Not only because it contributes to derangements we call mental disorders, but also because anxiety at a high level carries with it autonomic and endocrine reactions that tend to intensify or even to create a wide variety of human disorders. Many people are indeed "worried sick." Broad apprehensiveness and some accompanying anxiety is to some extent an aspect of almost every serious illness. And unfortunately, with the presence of either acute or chronic anxiety, the reparative process of the body may be grossly handicapped.

It is, then, one of the physician's responsibilities to promote some resolution of a patient's excessive and destructive anxiety. In this, the physician's most important assets are his medical training and his interest in his patient.

Steps in the management of anxiety are: (1) recognition of its presence, estimation of its degree and pervasiveness, and recognition of its causes, if possible; (2) immediate measures for its reduction, such as removal of the patient from grossly anxiety-provoking situations, re-establishment of some sense of security through the pa-

tient's confidence in the physician, and prescription of drugs as indicated; (3) development of the patient's understanding of his own mental state and the reasons for his anxiety to the end of giving him a greater comprehension and control of his own reaction; (4) encouragement of modification of the patient's life adjustment to prevent susceptibility to recurrence of runaway anxiety.

In dealing with anxiety, diagnosis and treatment are by no means separable. Diagnosis is a part of treatment, and the patient's response to treatment is a part of diagnosis. The physician should always bear in mind that the anxious patient is looking desperately for help and that he usually looks particularly to the physician by reason of the function and training of the medical man. Confidence and courage may be no less infectious than anxiety and fear, but can spread from physician to patient only if the patient feels a basis for confidence.

An initial element of tremendous importance, therefore, is how the physician conducts himself with relation to the patient. Important elements in determining the response of the patient are his belief (1) in the medical knowledge of the physician and (2) in the physician's interest in him as a person, not merely as a "case." Perhaps the order of these two points should be reversed, for the patient typically is much concerned about the physician's interest in him and is more likely to assume his physician's medical competence.

It is of the utmost importance that the physician clearly shows interest by a close, kindly, and understanding attention. This involves careful attention to what the patient is able to tell him. If the physician shows the simple human patience this requires—even when, as is often the case, some aspects of the patient's recital are essentially noncontributory so far as the organic aspects of the condition are concerned—and if the physician also has a professional confidence that his scientific learning and art will provide something of value to the patient, the initial contact may be transforming in its reassuring effect, even though such reassurance may be only temporary. A good beginning is, of course, only an initial step, but it can be of tremendous importance in facilitating therapeutic progress.

Physical signs of anxiety, while not wholly dependable, may indicate the degree and pervasiveness of emotion. Tense restlessness, a lined, worried face, wet palms, and chewed nails are proverbial. In severe states, the pulse may be rapid and the pupils dilated.

A careful medical examination of the patient should be undertaken initially and followed by whatever clinical and laboratory procedures are indicated. The physician should put himself in a position to speak with confidence as soon as possible.

Intelligent questions will often elicit clues to treatment. For example, a useful lead is, "Do you worry?" or, more tactfully, "Is it hard for you to relax?" The query, "Is sleep difficult?" may be followed by, "Are you kept awake by thinking?" and then by discussion of the troublesome thoughts.

How much fun does the worrier get out of life? How much satisfaction? General lack of both fun and satisfaction usually indicates intense anxiety or depression.

Situations that bring on, heighten, or lessen anxiety are often revealing. For example, mental or physical reactions noted by women at bedtime may indicate fear of pregnancy, resentment of marital relations, or dread of contraceptive measures

demanded by the husband but forbidden by religion. Men whose anxiety appears at bedtime may be troubled about sexual adequacy.

Does tension interfere with work or social life? Is the patient unable to meet some particular circumstances, and what is their nature? Is he constantly fatigued?

It may be found, for example, that a hypertensive patient experiences anxiety regularly in relation to illness or danger to the health of his elderly parent. If this parent has been domineering and the patient submissive, conflicting feelings related to guilty resentment may be a particularly important symptom in the genesis of anxiety.

Merely calling attention to the importance of such feelings may only make matters worse, for such a patient usually blames himself for his resentment—if, indeed, he is able to recognize it at all. What the patient needs is help in accepting himself and his feelings. Recognition by the physician that such feelings are natural or understandable will usually help. The physician may even find it helpful to volunteer (if it is true) that under the same circumstances, he thinks he would feel the same way. However, the physician should be careful not to fall into the error of advising or appearing to advise that it is right for the patient to feel as he does. Usually, the patient is committed to a belief that the feeling is wrong, and the physician's atempted support may merely serve to identify the physician with the forces of evil. On the other hand, the understandability of his feelings often means much to the patient, particularly when he cannot accept those feelings as right. It reduces the devasting feeling of aloneness.

Being ill in itself heightens apprehensiveness. Fear of indirect effects of the illness is common. The incapacitated businessman may dread financial failure; the employee, loss of pay and of job; the wife and mother, break-up of her home or neglect of her children.

Depression mixed with anxiety must be evaluated carefully because depression introduces the risk of suicide and affects management of the patient. In contrast to the fidgety, talkative, anxious person, the preponderantly sad individual is typically slowed down and finds it difficult or impossible to get through a day's work. The walk is languid, with short strides and no arm swinging; the head turns with the body as if rigidly joined. Early morning awakening, poor appetite, and sense of guilt are typical of depression. Crying spells are frequent and have special significance in men.

With agitated depression of the involutional period, anxious elements are outstanding. The condition is more severe, hazardous, and lasting than is the ordinary retarded depression, the depressed phase of the manic-depressive psychosis.

With extreme anxiety with depressive components, suicidal impulses should be appraised by questioning the patient as well as the family. "When you are very anxious, what do you feel like doing?" "How are your spirits?" "Is life worth living?" If the answer is negative, "Have you ever thought of doing anything about it? What?"

It is neither desirable nor necessary to give false assurances to a patient. There is a strongly reassuring quality in kindly, direct, frank, yet, so far as possible, encouraging answers. Such replies usually give the patient the feeling that the physi-

cian can be trusted and believed. If ominous signs are apparent in the patient's condition, the physician will, of course, use discretion in how much is disclosed to the patient, for no virtue exists in panicking an already overanxious patient. It is generally, of course, good practice to inform the relatives in as nonalarming a manner as possible about any serious potentialities that cannot be discussed with the patient. An important result may be that the relatives will encourage continuance of the medical study until the questions are answered.

If the patient is panicky, it may be desirable to attack the problem simultaneously on both the medical and the psychologic levels, for the whole adaptive capacity of the patient—physiologic and psychologic—is interfered with when his level of anxiety is very high. When anxiety rises past a certain critical point, it readily "snowballs." Reducing the reactivity of the nervous system may be a necessary and important step in returning the system to normal functioning.

Sedatives have long been employed to provide restful sleep and to lower critical reactivity during waking hours. A practical diagnostic test is performed with 0.2 Gm. of amobarbital sodium. A minute or two after an intravenous injection, symptoms due to anxiety usually disappear.

Alcohol, the most popular sedative of the laity used for the relief of anxiety, is likely to cause addiction because it is readily available and is easily abused.

Phenobarbital is excellent as a sedative. Because of typically slow effect, however, terror-stricken patients may repeat doses too quickly. In the ensuing toxic fog, a potential suicide may take his life. Quick-acting barbiturates are employed chiefly to ensure sleep. Continued large doses of barbiturates will cause true addiction, and sudden withdrawal may bring on convulsions or psychotic reactions.

A new chapter is being written with the introduction of the ataractic drugs. I feel myself in no sense specially qualified to discuss them. However, it is evident that they have a method or methods of action different from those of the barbiturates, alcohol, and the anesthetics. These last-named agents selectively depress the newer or more recently evolved portions of the central nervous system and reduce or relieve anxiety at the expense of evident cortical depression. The true ataraxics tranquilize without impairment of consciousness.

With any medical discovery, there is a period of overenthusiastic and perhaps too indiscriminate use. In regard to the ataraxics, I believe we should ask ourselves these questions: (1) Is this patient's anxiety at a level that makes its reduction advisable? (2) Am I showing adequate respect for the possible toxic effect of this agent? (3) Have I sufficiently considered what help this patient may need in conjunction with an ataractic agent to provide an adequate and lasting resolution to his problem?

We should not forget that depressed states can be intensified or created either by chlorpromazine or perhaps especially by reserpine, and suicidal impulses may emerge. As a rule, signs of dejection contraindicate both compounds.

Next to faith in the medical adviser, the most urgent need of anxious patients is to understand what is wrong and what will be done for relief. Explanations should be clear, simple, encouraging, and matter of fact. The realm of alarmed uncertainty then shrinks, and what was a frightening unknown becomes a manageable problem.

The patient of limited intelligence, stereotyped thinking, and inflexible personality

may best be aided through an attitude of kindly authority. A pliant though modest intellect will perhaps gain far more from new insight. Intelligence generally furthers treatment, yet keen minds will at times erect barriers against assistance and may be difficult to influence.

Severe anxiety heightens susceptibility to further anxiety and tends to become self-sustaining or autonomous. Neither insight into primary causes nor their removal will always bring about recovery, although insight usually contributes toward improvement. Even when anxiety is severe, most affected patients eventually recover, occasionally in a spectacular way.

Courage to face responsibilities and uncertainties that are bound to remain must be built. As simpler tasks are met, confidence is acquired for greater difficulties. Pressing anxiety from a recent specific cause may be eliminated by a single visit, but treatment of a long-established pattern is inevitably time-consuming.

Treatment of anxiety is not complete until means of avoiding recurrence have been considered and suitable plans adopted. To quiet incipient perturbation is easier than to reduce established levels of anxiety.

If an original attack lasted some time or was repeated, the convalescent is asked to call his physician whenever worry is building up or threatens to get out of hand. A trying situation can be endured with regular intervals of relief. Once a week, the harassed mother may arrange to have an afternoon out, the tense student to enjoy a social date, or the businessman to play a round of golf.

When a psychiatrist is desired for diagnostic opinion or for therapy, the suggestion should be made tactfully to avoid provoking the spoken or silent rejoinder, "So you think I'm crazy? Well you're crazy!" The specialist may be described as skillful in dealing with tension, fear, and emotional strain, so that referral will not be mistaken for abandonment of a hopeless mental case.

Psychiatric consultation is indicated when anxiety is associated with strong depressive tone and/or suicidal preoccupation, increasing vagueness or incoherence, developing projection and persecution trends, threatening withdrawal, approaching panic, or obsessive and compulsive features or defenses.

The Society for the Scientific Study of Sex

The Society for the Scientific Study of Sex has recently been organized to foster interdisciplinary exchange in the field of sexual knowledge. The aim of the Society is to bring together scientists working in the biologic, medical, anthropologic, psychologic, sociologic, and allied fields who are conducting significant sexual research or whose profession confronts them with sexual problems. The Society will hold periodic scientific meetings for the presentation of research papers, and it will organize symposia, seminars, workshops, and conferences to consider theoretical and practical problems in the sexual area. It will also publish a scientific journal devoted to relevant original studies and reports. Further information concerning the Society and its activities may be obtained from: Robert Veit Sherwin, 285 Madison Avenue, New York 17, N. Y.

The Psychosomatic Conditions Encountered in Orthopedic Practice

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The scope of this presentation will include those conditions of an orthopedic nature that are seen in general practice, but will not include the emotional and psychologic features of the long-term crippling diseases and conditions such as poliomyelitis, paraplegia, or amputations, nor will it include the difficult problems of motivation for rehabilitation after orthopedic operations or fractures, nor will we discuss the problems involved in the detection of malingering.

We will first take up the establishment of the diagnosis of a psychosomatic condition in very general terms. It was formerly stated that a bizarre history and incongruous physical findings or a lack of physical findings should establish the diagnosis. I do not feel this to be true for there are too many rare and obscure conditions in orthopedics that often cause pain patterns unrelated to nerve distribution and frequently have no physical findings unless the examiner is aware of special tests that would establish the diagnosis. For example, a pain starting from the forehead, running posteriorly behind the ear, down the neck, to the arm and fingers, down the back to the thigh, leg, and toes, all on one side, is a condition that has, I am sure, many times been diagnosed as psychosomatic. However, this happens to fit a classical pattern of what is called Sluder's lower half neuralgia, which is due to a chronic nasal affection and can be cured by cocainization of the sphenopalatine ganglion. This is an example of the first point I wish to make—the labeling of a condition as psychosomatic is often due to a lack of diagnostic ability on the part of the examiner.

I should like to bring to attention a concept that might be developed—the idea of the constitutionally physically inferior patient. From birth, everything happens to him—every illness, every injury. As a young adult, he is a chronic weakling, which makes for chronic fatigue and multiplicity of physical (usually orthopedic) complaints. Is this a psychosomatic condition? I do not really think so—I believe that there are some persons who are just not as physically strong as the average person and that as a result, they have a high incidence of symptoms, disease, and injury. The concept is worth exploring.

We should next take up the problem of how the diagnosis of a psychosomatic condition should be established. An abstract of my ideas on the subject follows. I personally feel that there is nothing in the history that, in itself, can be considered diagnostic of a psychosomatic condition and, specifically, I include the manner in which a history is given and other factors—a whining tone, vagueness and indecision in the description of symptoms, the personality of the patient, the presence of chronic or habitual fatigue, a multiplicity of complaints, the possibility of gain from having an illness, the presence of litigation, the suggestibility of a patient, the social

or personal situation of the patient, or the presence of an obvious anxiety state. I also do not consider as diagnostic the recognition on the part of the patient that emotional difficulties intensify the symptoms, nor is cancerophobia or a patient's preconceived idea of the diagnosis—even if made by a physician. I do not consider that the use of an idiom of speech such as "he gives me a pain in the neck" is very significant in making the diagnosis. Many of these factors are highly suggestive in making the diagnosis, but, unfortunately, there are many patients whose personality, situation, and manner make us label them psychoneurotic, and when they have a complaint, an organic etiology is not considered strongly. This is hardly fair to them, for often they can be helped by organic treatment.

We should next take up the question of what factors in the physical examination should cause us to assign a psychosomatic diagnosis. Again, I do not believe that there is any single test that, in itself, should be considered diagnostic. Suggestive factors would include poor posture, a lack of consistency in the tenderness, strength, sensation, or range of motion of the part, lack of ability to relax, the skin traction test, the presence of bizarre patterns of hypesthesia. Very characteristic, almost to the point of being diagnostic, is the response of the patient to palpation in which she reports that every part of the area "hurts a little" when touched and no part of the area under consideration is free of tenderness. However, none of the factors mentioned are actually diagnostic and all must be interpreted with caution. One misused test is that of the ability to bend—the patient states and shows that he cannot bend well from the erect position, and yet he can sit with the hips flexed and knees extended. Is this not full trunk flexion, which he could not do in the erect position, and thus very significant? However, I do not believe it to be so, for the factor of weight-bearing was eliminated, and the finding occurs with fair regularity in patients with proved organic difficulties. I should like to leave this thought with you —the establishment of a psychosomatic diagnosis of an orthopedic condition is fraught with great difficulty and no single test is sufficiently reliable, but with a combination of the various tests and with a carefully taken history, the true diagnosis can be made in most instances. I would like to say at this point that most of my orthopedic colleagues make the psychosomatic diagnosis far too frequently and use the diagnosis as a method of escaping responsibility for the care of the patient.

Before taking up the question of specific orthopedic conditions, I would like to discuss treatment in general. First, should we give a diagnosis of a psychosomatic condition? Actually, we are usually forced to do so, and in many cases, the patient requests the diagnosis in writing. Even if the condition is a purely psychosomatic or almost entirely psychosomatic one, I usually give an organic diagnosis. Patients resent the implication that their condition is not organic; they develop a hostility and become more difficult to treat. Should a prognosis be given? I realize the strong value of suggestion that a good prognosis might have, but I generally avoid giving prognosis or give it in equivocal terms or percentages. I never use narcotics —I know of several instances of narcotic addiction produced by prescriptions for what I really feel to be largely psychosomatic illnesses. With respect to other medications, I have been very disappointed. Phenobarbital is worthless; mephenesin is only rarely helpful. Meprobamate and other similar ataractic medications are helpful if

there is a concomitant anxiety state, but this is not common and I use them very rarely. Home measures find their greatest value in these conditions—I use ethyl chloride sprays, heated salt collars for neck pain, warm baths, linaments, and salves. A remarkable number of patients can be cured by these measures, although it should be stated that in the majority who are cured, the conditions are a mixture of organic and psychosomatic.

The use of physical therapy has the inherent danger that the patient will be partly relieved and become as dependent on the treatment as a narcotic addict on drugs. There are several hospitals in this city treating patients by cabinet baking three times a week for years; 1 patient I know of was treated regularly for 10 years. Massage is pleasant for the patient but takes the personal time of the therapist. Once a clinic patient is put on massage, he will be reluctant to stop therapy. In private practice, the difficulty of paying for the treatment poses a problem, making it easier to discontinue therapy. I never use massage in either clinic or private practice. Of the other physical therapy modalities, the newest usually appeals most to the patient—this year it is ultrasound. However, its use is dangerous because of a narrow range between a necrotizing and a healing dosage. Two years ago, the most popular was microthermy, in which I personally do not place any real value. Diathermy is commonly used, but rarely with any real effect except for arthritis of the spine with radiculitis. In office and hospital practice, I use galvanism because first, I think it has a real therapeutic effect in organic conditions, and second, the patient has no doubt that he is receiving treatment—he feels a gentle pins and needles sensation, and as one patient said to me, "If this treatment doesn't cure you, it certainly feels like it ought to." I also use cabinet baking as a heat modality—I think it is more effective than diathermy. Therapeutic exercises, particularly of a recreational type, are of great value. I choose the method or methods of treatment that would cure or improve the organic condition that the patient has or that the psychosomatic condition most nearly resembles.

Now we may discuss some of the conditions commonly seen in orthopedic practice in which there is a mixture of organic and psychosomatic features. For example, is occipital neuralgia psychosomatic or organic? Local injections of procaine hydrochloride into the greater occipital nerve will cure the condition, but they are painful; probably the patient has a "flight into health" and later acquires another illness, the treatment for which is not so painful. Traction is also helpful sometimes. Chronic or acute myositis on exposure to cold or draught is usually helped by warm baths; sometimes ethyl chloride sprays are necessary. For those chronically afflicted, there is no real cure, although galvanism may produce relief lasting several months.

The common nontraumatic cause of trapezius myositis is poor posture of a temporary nature, usually psychogenic. The neck is thrust forward, causing muscle tension, pain, and spasm, and a vicious cycle is established. The neck pain may be severe and may radiate into the hand; it may resemble a herniated cervical disc remarkably. Treatment is with a shoulder retraction bracelet, ethyl chloride sprays, and galvanism. Sometimes local injections of procaine hydrochloride are used. Interscapular fibrositis is seen in many young women. Small fleshy knots develop in the rhomboid area, which may be related to overt or hidden anxiety. The pain

may be so agonizingly severe that morphine in heavy dosage will not give relief, or the pain may only penetrate the awareness, or it may be anywhere in between. Ethyl chloride sprays give much relief. The obvious case of spasmodic torticollis, with the tic in the neck, is amenable only to psychiatric treatment. There are many patients with a less obvious condition, having not a tic, but the gradual development of muscle spasm that lasts for minutes or hours, sometimes accompanied by a peculiar attitude of the neck and usually painful. I know of no treatment for this condition other than psychiatric. An article published about seven years ago advised section of the cervical nerves and the subsequent wearing of a brace. I take this opportunity to say that most orthopedists do not agree with this, although the article came from a major medical center in this country.

Upper dorsal backache, often coupled with poor posture and/or a chronic fatigue pattern, is easily remedied with a shoulder elastic retraction bracelet. For hand paralysis or weakness after injury, suggestion, whirlpool, galvanism, and exercises are the methods of treatment. When the condition persists, even after termination of any litigation, a cure is difficult, and I would suggest psychiatric treatment. Sometimes hypnosis or suggestion under thiopental narcosis can be used. The situation does not warrant long-term analysis. With respect to mechanical derangements of the back, which form about 90 per cent of the back conditions seen in private and clinic practice, they can be roughly classified into two types: the fibrositic type and the unstable type. A patient with the fibrositic type has a negative hyperextension sign, has muscle spasm that varies from intense to mild, has psychosomatic features that are often overt, and is best treated by activity therapy —gymnastics or recreational activity. This is a common condition and one that chiropractors can cure by manipulation. A patient with the unstable type does poorly with activity, gets worse with exertion, has a positive hyperextension sign, and has muscle spasm that varies with the extent of activity (it gets worse with activity, whereas in the fibrositic type there is relief of muscle spasm with moderate activity). The psychosomatic features are often not overt to the patient, and any suggestion that the condition is psychosomatic is resented. There is often litigation involved with this particular condition. With or without thought of psychosomatic features, the best treatment is restriction of activity and sometimes bedrest and traction. The evaluation of psychosomatic features in this type of illness is fraught with great danger. The diagnosis is always, at least in part, organic. A purely psychosomatic backache, i.e., one without organic features, either has no findings or the findings resemble the fibrostic type rather than the unstable type.

With respect to what is called camptocormia—the bent and twisted back of an injured worker—a condition thought to be psychosomatic, I believe the diagnosis is often manufactured by company and insurance company physicians. As far as I am concerned, a fixed or variable bent forward attitude of a patient is organic and is due to disc injury, either intrinsic or herniated. Coccygodynia is a condition notoriously treacherous to us. Pain in the coccyx, whether related to injury or not, is difficult to evaluate. There is something peculiarly psychogenic about such pain. I suggest treatment of the condition with galvanism or changes in sitting posture, but the organic type requires operation and the functional type is best helped by rectal mas-

sages. The difficulty of separating the types is so great that we operate for the removal of a coccyx only in those patients with demonstrable roentgenographic changes. Unfortunately, I am sure that we deny effective treatment to many who could be helped, but by the same token, if we operate more frequently, we would be doing the procedure uselessly too many times and sometimes to the jeopardy of the patient—at least the emotional jeopardy. Writer's cramp is a condition that either might be psychogenic or might be related to some obscure muscle condition in the forearm, or it might be found in the constitutionally physically inferior person referred to previously. I do not know a really effective treatment, I having had both successes and failures with galvanism and with whirlpool.

Despite the obvious roentgenographic and physical findings, I believe that Sudeck's atrophy is psychosomatic. It occurs with much greater frequency in emotionally disturbed and overanxious patients. Treatment is directed along organic lines—protected activity and physical therapy. Treatment of joint stiffness or contractures for which no organic cause can be found, such as the clenched hand, the stiff extended knee, the abducted shoulder, is a highly controversial subject. I personally use feigned anesthesia, strong suggestion, and either manipulation or painful electric stimuli, creating a "flight into health." In my experience, only once have I produced a marked anxiety reaction, but I am sure that there will be great differences of opinion as to the method of handling this condition. The complaint of weak knees is frequently seen in an orthopedic practice. The condition may be due to arthritis or to a knee injury or it may be psychosomatic. The complaint is that the knees buckle repeatedly. I generally prescribe systematic therapeutic exercises. However, in my experience, the patients rarely do them and instead usually leave me and see another physician. While I disagree most strongly with the method, I know of several patients who were markedly helped by the use of braces. I should mention a few words about posture in children, particularly girls. I believe that the problem is largely psychogenic and is usually brought on by an overdominant mother who carps at the child all day and never permits self-reliance. I try to solve the problem by making the child a good athlete, and the method works very well.

You will notice that for most of these conditions, I did not recommend psychiatric treatment. First, the disturbance to the patient's life is not severe enough to warrant long-term analysis; second, I feel that by treating the organic condition, a cure will result; third, in those conditions I cannot cure (unfortunately, this group includes many patients with chronic unstable or weak backs who cannot return to any occupation other than manual labor and also includes those with marked litigation components to their illness), I have not seen psychiatrists accomplish anything until the situational difficulties were overcome.

To conclude, the labeling of a condition as psychosomatic is often due to lack of diagnostic ability on the part of the examiner. There is no short cut to the diagnosis, either in the history or in the physical examination—that is, there is no single test that will establish or disprove a psychosomatic diagnosis. With respect to treatment, the treatment to use is the one best adapted to control the organic condition the patient has or which his psychosomatic condition most resembles.

ATOMIC MEDICINE TOOL. A new medical device has been developed by the Veterans Administration for measuring total body radioactivity of the human body. More sensitive than conventional radioactivity detectors, the new instrument enables scientists to study functions inside the body by observing natural radioactivity of the body. Tracers can be followed in the body; also, the whole body can be studied.

LYSINE INCREASES GASTRIC SECRETION. Addition of 5 Gm. of lysine monohydrochloride to a bread and water test meal "significantly increased" gastric secretion of hydrochloric acid, pepsin, or both, in 18 of 21 subjects in a clinical study by Drs. Arthur M. Sackler and Lawrence H. Sophian (Science 126:255, 1957). The physicians suggest that this may explain in part the findings of clinical investigators that lysine helps improve appetite in anorectic patients.

TRIIODOTHYRONINE REDUCES GOITER SIZE. Treatment with triiodothyronine for 3 to 18 months caused some reduction of goiter size in 36 patients, reports Dr. Paul Starr (University of Southern California School of Medicine). In about 25 per cent of cases, the goiter became invisible. Triiodothyronine is also a diagnostic aid: if a lump in the throat does not shrink when the drug is given, surgical removal is warranted since the lump may be malignant.

FLUORIDATED TABLE SALT DESCRIBED. A new fluorine compound, sodium monofluorophosphate, said to be one-third as toxic as sodium fluoride and which can be added to table salt, was described by Dr. Gunnar Santesson, Stockholm (meeting of European Organization for Research on Fluorine and Dental Caries Prevention). The new compound in solution does not quickly break down into free fluoride ions but into a highly stable, complex ion. Use of fluoridated salt offers a safer guarantee against overdosing than fluoridating water, Dr. Santesson says.

NEW ANTIBIOTIC KILLS BOTH FUNGI AND INSECTS. A new antibiotic that kills both fungi and insects and has proved

to be 10 times more effective against flies than DDT has been discovered by Drs. R. Craveri and G. Giolitti (Montecatini Antibiotic Research Laboratories, Milan, Italy). Called flavensomycin, the antibiotic was isolated from a strain of the Streptomyces tanaschiensis type. The substance was also effective against migrating locusts.

STEROID THERAPY IN MUMPS. Treatment with hydrocortisone, prednisone, or corticotropin was followed by a rapid remission in each of 4 cases of mumps orchitis (Ann. Int. Med. 46:852, 1957). Local inflammation and generalized systemic effects were reduced dramatically. One patient received 20 mg. of hydrocortisone four times a day from the second day of illness; 2 were given 5 mg. of prednisone four times a day from the second and sixth days, respectively; the remaining patient was given intramuscular injections of 20 mg. of corticotropin every six hours on the eighth day followed by decreasing doses.

LINK BETWEEN SEDATION AND BIRTH DAMAGE STUDIED. A possible link between oversedation during childbirth and mental or physical damage to the infant is being studied at Duke University Medical School under a grant from the National Institutes of Health. Brain damage similar to that seen in cerebral palsy is produced in animals by anoxia during birth. The research workers think oversedation may produce such anoxia as well as impairment of circulatory and respiratory patterns.

LABOR UNDER HYPNOSIS. About 25 per cent of women can be carried through the early stage of labor under hypnosis without chemical anesthesia, reported Dr. William S. Kroger, Chicago Medical School, at the seventh American Congress on Maternal Care. Drugs can be markedly reduced in about 40 per cent of the rest of the women, he said.

FACTORS COMMON TO ARTHRITIC PERSONS. A study of 1300 arthritic persons showed that factors most common to women with the disease were lack of education, the bearing of many children, and lack of time for recreation during early adulthood, reported Dr. Sidney Cobb (Pittsburgh) at the Ninth International Congress on Rheumatic Diseases. Among arthritic men, lack of education, low income, broken marriages, and a worrying type of personality were frequent factors that may be contributive.

An Evaluation of Prochlorperazine in the Ambulatory Treatment of Psychiatric Patients

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This paper represents our initial clinical evaluation of prochlorperazine,* a new phenothiazine derivative, in psychiatric practice. This new preparation is a 2-chloro-10-(3-N-methylpiperazinylpropyl) phenothiazine, an analogue of chlorpromazine.

METHOD

The report is based on a four and one-half month study during which time 80 patients with psychiatric problems were treated on an ambulatory basis. Forty-seven patients were women, ranging in age from 20 to 80 years, while 33 were men who were 24 to 72 years of age. The duration of treatment ranged from two weeks to four months.

Diagnostically 53 patients had psychoneuroses of various types, while 19 had schizophrenia of various types and 8 had involutional depressions.

The technique of evaluation of the levels of improvement has previously been reported.[1] This method evaluates the relief of symptoms, decrease in anxiety, the patient's adaptation to his routine vocational and social responsibilities, and the degree of pleasure and pride that he obtains in his performance. It is presented here in detail.

TECHNIQUE OF DRUG EVALUATION

Performance.

VOCATIONAL PERFORMANCE. (1) Excellent—full-time employment. Functioning efficiently *without* strain. Great pride and pleasure from attainments. (2) Good—full-time employment. Greater effort required than was necessary prior to illness. Moderate pride and pleasure from attainments. (3) Fair—working intermittently with considerable difficulties, frequent absences. Faulty performance at times. Lack of pride and pleasure. (4) Poor—unable to perform at all.

SOCIAL PERFORMANCE (individual and group interpersonal relationships). (1) Excellent—active and comfortable. High level of pride and pleasure obtained. (2) Good—active but with slight to moderate difficulties at times. Limited capacity for pleasure. (3) Fair—socializes with great difficulty. Readily becomes very anxious. Lack of pride and very limited and infrequent pleasure. (4) Poor—seclusiveness and chaotic relations.

Amelioration of Anxiety. Anxiety is defined for our purpose here in its broadest aspect. We will consider it synonymous with fear whether this fear is generated by unconscious conflicts or actual environmental difficulties. We attempted to quanti-

* The trade name of Smith, Kline & French Laboratories for prochlorperazine is Compazine.

tate anxiety according to a four point scale after breaking down this psychophysiologic phenomenon into several components, namely, (1) motor component, (2) affectual component, and (3) verbal component. (1) Calm—no restlessness. Overt expression of fear, when it occurs, is appropriate to the severity of the actual stress. (2) Slight restlessness, slight affectual expression of fear, slight pressure of speech. (3) Marked restlessness, pacing. Marked overt affectual expression of fear. Often severe pressure of speech. (4) Panic.

Amelioration of Initial Symptoms. (1) Excellent—all symptoms completely gone. (2) Good—symptoms markedly reduced in intensity and frequency. Patient able to cope with them. (3) Fair—slight improvement only, with the symptoms continuing to plague the patient most of the time and with marked impact. (4) Poor—symptoms unchanged.

Dreams. Whenever possible, patients' dreams were studied in an attempt to gain additional information. Disappearance of nightmares, decrease in frequency of rage dreams, and an increase in the frequency of pleasant dreams were evaluated.

The final improvement rating was indicated on a four point scale that took into account all the factors just listed. (1) Excellent—full-time employment. Active and comfortable in social performance. Marked pride and pleasure from vocational and social performance. (2) Good—full-time employment but requiring slightly greater effort than usual. Active socially but with slight to moderate difficulties at times. Slight residual anxiety. Symptoms markedly reduced in intensity and frequency. Limited pride and pleasure from performance. (3) Fair—working but with considerable difficulties. Frequent absences. Socializes with great difficulty. Moderate to marked residual anxiety. Slight improvement in symptoms. Minimal pride and pleasure from performance. (4) Poor—unable to perform vocationally or socially. Anxiety level severe and unchanged. Symptoms unchanged. Absence of pride or pleasure from performance.

The ataraxics, as a group, have been shown to be most effective in patients manifesting marked overt anxiety and are relatively ineffective in patients manifesting very little affect. In our experience, this fact holds true whether the patient is diagnosed as having a psychoneurosis or a more severe illness such as schizophrenia.[1]

Prochlorperazine used in dosages of 75 mg./day or less was effective as an ataraxic in those patients who manifested slight to relatively marked anxiety but was not very effective in patients who were in a panic or were emotionally "flat."

Reviewing table I, one notes that prochlorperazine is most effective in those patients manifesting a moderate degree of anxiety. Among the 37 patients with grade 2 anxiety (moderate degree), the drug was very effective (improvement ratings 1 and 2) in 20 (54 per cent). Of the 23 patients with grade 3 anxiety (moderate to marked), significant improvement (improvement ratings 1 and 2) was noted in 9 (39 per cent).

Prochlorperazine, in the anxiety range used here, appeared to be relatively ineffective in patients with a flat affect (grade 1 anxiety) on the one hand or in a wild state of panic (grade 4 anxiety) on the other. The efficacy of the drug did not appear to be affected by the diagnostic entity, for the results noted were approximately the same whether the patient had a psychoneurosis or schizophrenia. All results with the involutional melancholias were poor, but this was attributed to the fact that most

of these patients had anxiety levels of 3+ or 4. The degree of overtly expressed anxiety appeared to be the factor of importance in determining whether prochlorperazine would be significant and beneficial.

Prochlorperazine is effective in the same type of patient in whom meprobamate has been found of value, but has the advantage of having a less soporific side effect than meprobamate. In the dosages used, prochlorperazine is not a substitute for large doses of chlorpromazine in the very severe anxiety states or in the very anxious schizophrenic patients.

TECHNIQUE OF ADMINISTRATION

Our average initial daily dosage was 20 mg. This was gradually increased during the following two weeks until most patients were taking 50 to 60 mg./day. We found, in general, that the best results were obtained in this range. In 9 patients the dosage was raised to 75 mg./day. In 11, satisfactory results were obtained with 40 mg./day or less.

Beneficial effects usually appeared during the first two weeks of therapy. If they did not appear by then, we found that prolonged therapy was of no avail.

COMPLICATIONS OF PROCHLORPERAZINE THERAPY

The adverse side effects resulting from the use of prochlorperazine, in the dosages employed in our series, were minimal. Blood counts and urinalyses performed on 47 patients revealed no abnormal changes secondary to the drug. Drowsiness, slight in degree, was the most common side effect seen. It was noted in 32 patients during the first week of treatment. It cleared spontaneously in 28 patients, and in only 4 was it disturbing enough to require the use of small amounts of amphetamine. Twenty-two patients reported slight to moderate dryness of the mouth, while 16 complained of mild nasal stuffiness. A slight drop in blood pressure was noted in 5 patients, but this was unaccompanied by any subjective manifestations. Minimal extrapyramidal-like symptoms were recorded in 4 patients. In 1 they were described as a "feeling of stiffness in my face." One patient reported that his tongue felt clumsy when the daily dosage was 60 mg. or more.

No grippelike syndromes, jaundice, hypersensitivity to heat or sun, arthralgia, or dermatitides were seen.

TABLE I

Anxiety as a Factor Affecting Degree of Improvement

	Degree of improvement			
Degree of anxiety	1	2	3	4
1	0	0	4	6
2	3	17	13	4
3	2	7	10	4
4	0	1	3	6
Total	5	25	30	20

As mentioned previously, no patient was included in this series unless he had been using the drug for at least two weeks. Fifty-three patients have been on the medication for more than one month. Of these, 19 have been on it for two to three months while 8 have been taking it for more than three months. We found that all the symptoms, except the mild extrapyramidal-like manifestations, appeared during the first two weeks of drug therapy. The extrapyramidal-like symptoms appeared to be related to dosage and not to duration of treatment.

DISCUSSION AND CONCLUSIONS

Prochlorperazine is another of the synthetic phenothiazine derivatives that has beneficial effects in patients with emotional difficulties. Three other phenothiazine derivatives, namely, chlorpromazine, promazine, and promethazine, have found wide use in psychiatric practice. Prochlorperazine was studied in a continuing search for a preparation that would be effective in relatively small dosages in the management of psychiatric illnesses and at the same time have few adverse side effects.

Broussolle and Dubin,[3] after a study of 28 psychiatric patients, reported that prochlorperazine appeared to be "active" in much smaller dosages than chlorpromazine. They found that adverse side effects could be readily avoided if a dosage of 75 mg./day was not exceeded. Vischer,[4] in another study, reported that the drug was very effective in 21 of 38 "mildly disturbed patients," most of whom he characterized as having psychoneuroses. He found no marked adverse side effects.

Our results with prochlorperazine would seem to indicate that this drug is an effective and safe ataraxic in dosages of 75 mg. or less per day in psychiatric patients who demonstrate a moderate degree of anxiety. As with all the ataraxics, it is ineffectual in patients who manifest very little overt anxiety. In this dosage range it is not of significant help in patients with a very marked degree of anxiety.

SUMMARY

Eighty ambulatory psychiatric patients were treated with prochlorperazine, a new analogue of chlorpromazine.

The preparation was significantly effective in patients manifesting moderate degrees of anxiety. Dosages required were relatively small; side effects were minimal.

Prochlorperazine appears to be another phenothiazine derivative with significant ataractic effects and deserves further study.

ACKNOWLEDGMENT

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BOOK REVIEWS

The Compleat Pediatrician. WILBURT C. DAVISON, M.D., AND JEANA DAVISON LEVINTHAL, M.D. Durham, N. C., Duke University Press, 1957.

This new edition brings the vast pediatric literature up to date and eliminates many of the pediatric items that have become obsolete. The authors have been able to compile and condense practical pediatric facts in one handy volume. The emphasis is on symptoms and signs as clues to early diagnosis before therapy is instituted and on the threefold aim in pediatric practice, i. e., appraisal of normal children in terms of growth, development, and disease prevention from conception through adolescence, early recognition and treatment of sick children, and cultivation of a balanced personality throughout the developmental period. This useful book is filled with items of essential clinical pediatric information that often escape the memory. It makes a good reference to bring to mind suggestions on diagnosis and treatment and is invaluable for every pediatrician's desk.—*I. Newton Kugelmass, M.D.*

Physiologic Principles of Surgery. LEO M. ZIMMERMAN, M.D., AND RACHMIEL LEVINE, M.D., Philadelphia, W. B. Saunders Company, 1957.

Clinical surgery has long passed its preoccupation with structural arrangement. Modern surgery is concerned primarily with functional disorders. The physiologic alterations in the organs occasioned by injury and disease, the effects produced by anesthesia and operation, and the maintenance of optimal internal environment constitute the current concern. Surgical physiology is evaluated in terms of metabolic changes, infections, injuries, hemorrhage, body fluids, transfusion, nutrition, and anesthesia. Each organ is then evaluated in terms of surgical physiology and pathology as a basis for operative intervention. A team of experts concerned with experimental surgery have cooperated to include in this textbook all current concepts of dynamic surgery, from head to toe. The chapters are written by various experts and have been integrated by the authors into a clear book, well written, beautifully illustrated, and completely documented.—*I. Newton Kugelmass, M.D.*

Etiologic Factors in Renal Lithiasis. Edited by ARTHUR J. BUTTS, M.D. Springfield, Charles C Thomas Publisher, 1956. Price $12.50

The problem of calculus formation in the urinary tract and the methods of treating affected persons have remained a challenge to medicine despite many theories and investigations. Many factors are involved, especially urinary retention, bacterial infection, metabolic error, unbalanced diet, and unfavorable environment. There must be a common underlying factor without which calculi could not form. A generation ago the influence of colloids was proposed in the formation of stones with a view toward prevention and treatment. Recent advances in colloid chemistry have confirmed the role of protective colloids in maintaining urine as a supersaturated solution. The editor of this book observed that administration of hyaluronidase and

consequent release of hyaluronic acid influenced the character of the urine of patients with calculi. Apparently, the enzyme increased the protective action of urinary colloids by preventing precipitation of crystalloids. The static approach to the problem in the past has given way to the dynamic concept presented in this extensive monograph. After an historical survey of the subject, the authors present mineral metabolism in relation to lithiasis, discuss the chemical mechanisms involved in calculus formation, and formulate preventive procedures and modern methods of treatment as part of everyday practice. The book is an invaluable guide to effective practice of urology.
—*I. Newton Kugelmass, M.D.*

Gestation. Transactions of the Third Conference, March 6, 7, and 8, 1956, Princeton, N. J. Edited by CLAUDE A. VILLEE, PH.D New York, Josiah Macy, Jr. Foundation, 1957. Price $4.75.

The Third Conference on Gestation included a group of scientists who presented their recent studies on maternal endocrine secretions, maternal hormones in pregnancy, ovulation cycles, adrenal cortex secretions, gonadal agenesis, fetal endocrine glands, pituitary interrelationships, and cellular metabolism during gestation. These subjects are presented vividly by the experimenters, documented by related literature and illustrated with experimental data.—*I. Newton Kugelmass, M.D.*

Psychopharmacology. Edited by NATHAN S. KLINE. Washington, American Association for the Advancement of Science, 1956. Pp. 175. 3 figures. Price $3.50.

This monograph embodies some major contributions on the new pharmaceuticals in the field of mental disease. Kinross-Wright maintains that we have no panacea in chlorpromazine although it is an extremely valuable compound that contributes much to the treatment plan but does not suffice by itself. Hollister contends that ataraxics produce considerable improvement but are not the beginning of the end of therapy but rather the end of the beginning. Other workers are more cautious about dosage and effects of drugs given alone or in combination with each other or with other drugs on the central sympathetic and autonomic nervous systems. Each contribution is followed by discussion of the participants. The monograph is invaluable for psychiatrists in private and hospital practice.—*I. Newton Kugelmass, M.D.*

Biochemical Disorders in Human Disease. Edited by R. H. S. THOMPSON AND E. J. KING. New York, Academic Press, Inc., 1957. Price $12.50.

Our newer knowledge of the processes underlying disease now takes us beyond the limits of classic cellular pathology into the realms of abnormalities resulting from disorders of the enzyme-catalyzed reactions occurring within the cells. The pathology of many diseases is now passing from the stage of morbid histology to that of morbid biochemistry. The rapid strides in biochemical theory and technique are made possible by the penetration of cellular mechanisms in disease enabling the biochemical interpretation of disease processes, especially abnormalities of enzyme action and deviations in electrolyte balance. This book contains the contributions of outstanding scientists on the mechanisms of biochemical disorders in human disease. Many of the revela-

tions not only elucidate pathogenesis but clarify diagnoses and management of both medical and surgical patients. The chapters are given in terms of organ-basis rather than in terms of biochemical concepts. Each chapter thus presents the various diseases of all organ systems featuring biochemical disorders and advancements. The approach is individual but the context is clear and concise. Many biochemical disorders have been omitted, i. e., diseases of the skin, infectious diseases, and cancer, because of the heterogeneity of the biochemical advances and the difficulty of correlating them for clinical application. The book is a veritable mine of recent advances in biochemistry of human disease.—*I. Newton Kugelmass, M.D.*

Cerebral Palsy, Its Individual and Community Problems. Edited by WILLIAM M. CRUICKSHANK, PH.D., AND GEORGE M. RAUS, M.D. Syracuse, N. Y., Syracuse University Press, 1955.

The editors and contributors have done a remarkable job in presenting a comprehensive picture of a complicated medical problem, embodying medical, psychologic, therapeutic, and rehabilitation points of view in the management of the child with cerebral palsy. After all, the symptomatic therapy is so diverse and so individual that a heterogeneous group of specialists is required to achieve some semblance of improvement. Furthermore, the supervising physician must integrate these disciplines in the common cause. Part I of the book is devoted to individual assessment and part II to symptomatic therapy; each is written by experts in the field devoted to the cerebral palsy problem. The only important omission in the review is the integration role of the mother, the natural trainer of the crippled child. Each of the workers in the field presents his methods but omits the home function of the mother, who knows best the strength and weakness of her afflicted child.—*I. Newton Kugelmass, M.D.*

Ultramicro Methods for Clinical Laboratories. EDWIN M. KNIGHTS. New York, Grune & Stratton, Inc., 1957. Price $4.75.

The use of accurate and rapid ultramicro methods for quantitative determination of chemical constituents of blood or other body fluid represents an important advance in the clinical laboratory. The need for such methods is readily recognized whenever only minute amounts of material are available, as with infants, children, and small experimental animals; whenever superficial veins are not accessible, available, or adequate for withdrawal of blood; or when frequent sampling or multiple testing of blood is desired, even in adults with large and easily accessible superficial veins.

Until now these methods have been employed mainly in larger clinical laboratories or in biologic experimental studies, inasmuch as an extra measure of skill and care is necessary. Compared with the grosser methods, the performance of ultramicro techniques requires less space and permits economy of equipment and reagents. Clinically their employment in selected patients has been advantageous to the patients and has regularly proved popular with the attending physicians. Ultramicro chemical methods are now a valuable adjuvant to modern clinical pathology. This manual makes available in ready form a number of practical techniques indispensable in office and hospital practice.—*I. Newton Kugelmass, M.D.*

ADVANCED REPORTS FROM CURRENT MEDICAL MEETINGS

This section of the INTERNATIONAL RECORD OF MEDICINE features reports on papers delivered at current medical meetings in the United States and abroad.

Sarcoidosis

New York City.—"The mortality rate from sarcoidosis over a 10 year period varies from 5 to 10 per cent," says L. Siltzbach (Columbia University College of Physicians and Surgeons, New York City), who points out that sarcoidosis is a disease more frequently observed in Negroes than in other persons. There has been a recent increase in the disease as seen in the Puerto Rican population, Dr. Siltzbach says. It is most often seen in the 25 to 40 year age group, and women outnumber men by a 3:2 ratio.

Most cases are discovered by routine chest roentgenogram. In a recent survey among Negroes, sarcoidosis was detected by roentgenogram in 1 of 2000 persons, while only 3 cases of active tuberculosis were detected. The usual presentation is symmetrical enlargement of the bronchopulmonary lymph nodes. These lie within the lung area, distinct from the hilum, and are associated with splaying of the bronchi. Usually there are no symptoms; however, in rare instances, a patient may complain of cough or shortness of breath.

Blurring of the vision may be an early symptom, and 23 per cent of patients have visual difficulties at some time during the course of the disease. Patients may also present because of tiny nodules resembling milia on the nose, nasolabial folds, eyelids, forehead, or "V" of the neck. Initial manifestations of sarcoidosis have included: enlarged cervical glands, meningeal symptoms, bilateral facial palsy, parotid enlargement, anorexia, polyuria, and polydipsia due to hypercalcemia, and erythema nodosum. The latter is particularly suggestive of sarcoidosis when found in Negro women, Dr. Siltzbach states. Drug reactions are the most frequent cause; rheumatic fever is rarely associated with it.

The differential diagnosis includes: tuberculosis, histoplasmosis, leprosy, the pneumoconioses, lymphoma, lymphangitic spread of a carcinoma, Hamman-Rich syndrome, mumps, rheumatic fever, rheumatoid arthritis, other collagen diseases trichinosis, nephritis, hyperparathyroidism. Scalene lymph node biopsy, skin biopsy, or muscle biopsy may make the conclusive diagnosis. Biopsy of a bronchus despite normal appearance to the bronchoscopist is frequently rewarding. Liver biopsy, though frequently demonstrative of pathology, is not diagnostic and may be confused with changes due to systemic fungus disease. The Nickerson-Kveim test is highly specific for the disease, being positive in 86 per cent of cases, with false positives being found in only 1 to 2 per cent, says Dr. Siltzbach. Microscopic examination of the skin biopsy four weeks after injection is the criterion for diagnosis. Gross examination of the papule is of no value.

Among the early cases, 62 patients initially showed only bilateral hilar adenopathy. Of these, 25 regressed almost completely, 6 went on to progressive fibrosis, and 1 died from the disease. Of 33 with miliary pulmonary lesions, 7 regressed almost completely, 13 went on to fibrosis, and 2 died. Those 14 patients with patchy pneumonic involvement had the poorest prognosis. Four had a remission, but 6 went on to fibrosis and 1 died. Dr. Siltzbach points out that of those patients experiencing a remission, only a quarter were left with significant damage. Furthermore, he states, alveolar-capillary block was a rare complication, while bullous emphysema was a more frequent sequela.

Although a spontaneous remission might occur, adrenocortical steroid therapy is recommended in certain situations, Dr. Siltzbach says. These include: miliary disease with alveolar-capillary block, the late fibrotic stage, cases with ocular central nervous system or meningeal manifestations, and cases with splenomegaly plus secondary hematologic manifestations. Dr. Siltzbach recommends that 20 to 30 mg./day of the metasteroids be used to get the patients under control and 10 to 20 mg. for maintenance. Skin lesions are particularly resistant to therapy. Steroid therapy was complicated by the development of active tuberculosis only once in 53 cases as compared to the development of active tuberculosis in 3 of a total of 150 cases of sarcoidosis. The steroid therapy was complicated by superimposed fungus infection only once.

(Presented before the staff meeting of the Mount Sinai Hospital, New York City, Aug. 5, 1957.)

Effects of Radiation on Electrophysiology of the Nervous System

Boston.—Several experimental studies concerned with the effect of roentgen and gamma radiation on the function of the central nervous system are outlined by Edgar A. Bering, Jr. (Harvard Medical School, Boston). The first series of experiments dealt with cerebral changes in monkeys produced by implantation of tantalum 182, which emits mainly gamma radiation. Anatomically, a small area of cortical necrosis is seen adjacent to the site of implantation. Functionally, the monkeys would develop hemiparesis if sufficient radiation were delivered to a motor area. The neurologic changes would become stabilized in about three years. The late effects of radiation were reflected mostly in the behavior of the monkeys. They became less aggressive for food and were most easily caught in their cages. Once caught, however, they would struggle fiercely, unlike the normal monkey in this situation.

Electroencephalographic studies on the monkeys revealed ipsilateral slower frequency and lower voltage in the acute stage. These changes would revert to normal in two to three months. However, the frequency would gradually increase during the following two years, sometimes in an asymmetric fashion. Only 1 monkey developed clinical seizures, although 2 monkeys had electroencephalographic seizure patterns.

There was evidence that spinal cord conduction and spontaneous activity was not affected by 175 r./day. However, the electrospinogram revealed a suggestive slowing of cord conduction in the spine of cats that received sufficient radiation. These were acute and reversible changes, reflecting the delayed appearance of a monosynaptic reflex. There was also a decrement in subsequent polysynaptic activity after a stimulus. Incidentally, it was of interest that pentobarbital sodium seemed to depress spinal cord reflexes.

Paraplegia developed if the monkeys were given sufficient radiation. This often seemed the result of infection, vertebral collapse, and possibly vascular thromboses. It is of interest clinically that cord sites vulnerable to radiation are areas of poor collateral circulation. Roentgen overdosage may cause a gradually continuing infarction due to thrombosis of blood vessels.

(Presented at the Peter Bent Brigham Hospital, Boston, July 23, 1957.)

Malignant Disease of the Upper Respiratory Tract

London, England.—It is well known that in many cases of malignant disease of the upper respiratory tract, the condition is relatively advanced when the patient presents for treatment, says W. A. Mill (London, England). The symptoms of the disease are not in the least pathognomonic but are common to many simple affections, of which the patient may well have had previous experience; hence the symptoms are disregarded. The patient's medical adviser may similarly be misled at first by the apparent mildness of the symptoms. It is certainly

difficult for him in many cases to examine the patient adequately.

In the nose or nasal sinuses the common symptoms are, first, nasal obstruction and discharge, not at all unlike those in some infective conditions. Later there may be swelling of the face or blood-stained discharge. The finding of polypi in the nose of a person older than 50 should always raise the suspicion of underlying malignant disease.

In the nasopharynx the commonest symptoms are nasal obstruction and catarrh. Here, however, deafness is not unusual, and only too often cervical gland enlargement leads to the finding of the primary lesion. Pain in the head, ear, face, or jaws is not uncommon. Occasionally, the nasal discharge or the sputum is blood-stained.

In the pharynx, generally it is well to take note of the slightest symptom of discomfort or irritation. Later, of course, definite pain, soreness on swallowing, or even dysphagia will appear. Here again, the insidious enlargement of cervical glands may be the first sign of serious trouble. The most prevalent symptom of malignant disease of the larynx is huskiness or hoarseness. It cannot be emphasized too strongly that early advice must be sought concerning any hoarseness that does not readily yield to simple treatment within two or three weeks. Only too often the hoarseness is simply regarded as the aftermath of a cold that is taking time to clear.

(Presented before the Section of Otorhinolaryngology, British Medical Association, Newcastle, England, July 15–19, 1957.)

General Geography of Gastroduodenal Ulcers

New York City.—After examining information originating in 40 countries distributed over all continents, with an aggregate population of 1,231,735,000 people—a little less than half the world's population—Jacques M. May (New York City) reports that there is no significant correlation between incidence of peptic ulcer and the most important alleged stimuli to ulcer—occupation, diet and nutritional habits, and environmental stresses. Were a true, consistent map of the geographic occurrence of ulcer available, it would shed light on the etiology and pathogenesis of the condition. Unfortunately, no such map yet exists.

Study of the correlation between genetic markers, such as blood group and disease incidence, should be pursued, he emphasizes. What is now known of the genetic characteristics of the people with high and low incidence of peptic ulcers is insufficient to permit drawing conclusions at the present time.

For no understandable reasons, Dr. May declares, countries such as Japan and Chile have a very high death rate from gastric ulcers (32.1 per 100,000 and 7.1 per 100,000, respectively, in men). Scotland, England, and Wales, for example, have a death rate for duodenal ulcers that is remarkably high (9.7 per 100,000) as compared with that of other countries. Gastric ulcers predominate over duodenal ulcers in certain countries; the reverse is true in others. "There is no reasonable explanation for this situation," Dr. May states. Yet the predominance of one form over the other is striking in some countries. Reports from India, for instance, show 20 to 40 times more duodenal ulcers than gastric ulcers.

Only one observation is common to all countries: in all forms of ulcer, men predominate. The proportion of men to women reaches 7:1 in some countries (Mexico, Sweden). The disease is probably far more common than is suspected; only a fraction of its real incidence comes to attention, Dr. May says. He suggests that genetic factors play an important role in the distribution pattern and should be actively explored.

(Presented before the International Society of Geographic Pathology, Paris, France, July 9–11, 1957.)

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